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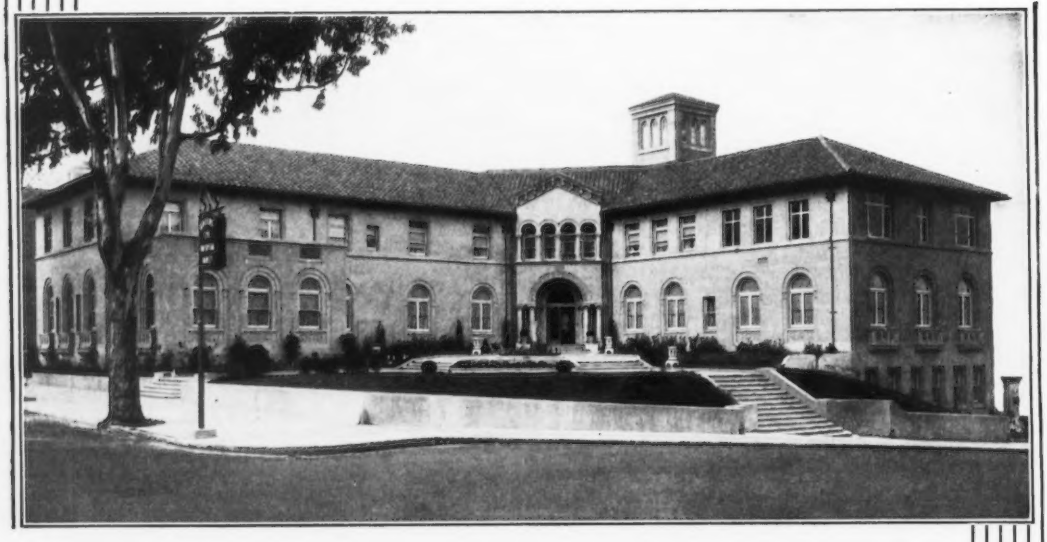

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CALIFORNIA
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VOLUME XXXIII SEPTEMBER, 1930 No. 3

HYPOCHLOREMIA*

By GEORGE M. CURTIS, M. D.
Chicago, Illinois

THE importance of the various blood electrolytes in relation to the life and health of animals and of man is now well recognized. Changes in the normal concentration of certain ions, or fluctuations in the balance between others, are associated with certain morbid conditions occurring spontaneously or produced experimentally. Following surgical operations, during which ether is used as the anesthetic, there occur definite changes in the calcium-potassium ratio of the blood. These are accompanied by a period of postoperative lethargy, and a marked tissue thirst, (Reuter and Andrews [1]). The lowering of the blood calcium in parathyroid tetany is now a matter of common observation, likewise its increase subsequent to the administration of Collip's hormone. In cretinism, the blood iodide is low. It is similarly lowered in individuals with non-toxic nodular goiters (de Quervain and Smith [3]). Clinical blood-chemical studies by Lunde [6] seem to have demonstrated the significance of the blood iodide in relation to the preoperative iodine treatment of exophthalmic goiter and the results of the subsequent thyroidectomy.

The chlorides of the blood, since they are the more readily determined by various analytical methods, have been particularly studied. The hypochloremia of upper intestinal obstruction has been frequently confirmed. A similar lowering of the blood chlorides is associated with the fatal effect of the total loss of gastric juice (Dragstedt and Ellis [4]). Orr and Haden [5] have recently reported that hypochloremia also occurs in dogs with fatal experimental peritonitis. We have observed a marked hypochloremia accompanying a strangulated hernia of omentum.[6] The blood chloride is low despite the blood concentration of the so-called toxemia following extensive superficial burns (Underhill et al.[7]). The symptoms of heat cramps, called also miner's cramp, stoker's cramp, or fireman's cramp, are initiated by a marked loss of perspired chlorides and are relieved by giving salt solutions. In view of these and other clinical findings, it appeared that the associated hypochloremia was possibly of more than subordinate importance. As a consequence, we have produced and studied it, as well as other changes in the blood chemistry, by the method of peritoneal dialysis.

Various crystalloids may be readily dialyzed away from the circulating blood through celloidin tubes inserted in the course of the blood stream. This process, called *vividiffusion*, was devised by Abel, Rowntree and Turner.[8] Dialysis also readily occurs through the serous membranes lining the body cavities.[9 10] Cohnheim [11] found that chlorides soon appear in glucose solutions injected intraperitoneally in rabbits. This is likewise true when varying concentrations of saccharose are employed.[12] When distilled water is injected intraperitoneally, a higher per cent of chlorides, up to 0.63 per cent, calculated as sodium chloride, is deviated from the blood stream and the blood chloride falls.[13] The intraperitoneal fluid soon becomes isosmotic and obtains up to 1.5 per cent of albuminous substance. Achloride electrolytes, as well as organic crystalloids, are likewise dialyzed from the blood stream. Consequently, it has been possible to lower the blood chloride experimentally by perfusing distilled water, or various chloride-free solutions, through the peritoneal cavity.[14]

COMMENT ON EXPERIMENTS WITH RABBITS

Healthy male rabbits, weighing between 2 and 2.5 kilos, were used throughout the experiments to be described. They were carefully prepared and given ample food and water, according to methods which have been outlined elsewhere.[12] After binding them to a padded animal board, a soft rubber catheter (a demeure) was introduced into the bladder. They were then lightly covered and kept warm by overhanging lamps. Under local anesthesia a steel trocar-inlet was inserted through the upper left abdominal wall, and by means of a lower abdominal incision a large, multiply perforated rubber tube was placed free in the right lateral peritoneal cavity, posterior to the intestines. In this manner extensive perfusion was assured. The perfusion fluid employed was maintained at body temperature by passage through a heated coil and the perfusion rate was kept uniformly at 500 cubic centimeters per hour. Blood was collected from the peripheral veins, or at death from the right heart.

In fifteen experiments distilled water alone was perfused through the peritoneal cavity. Within an hour there is an increase in the respiratory rate and fibrillary twitchings appear, usually in

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* From the Department of Surgery of the University of Chicago.

* Read before the General Medical Section of the California Medical Association, at the Fifty-ninth Annual Session, Del Monte, April 28-May 1, 1930.

* The experimental work, upon which this paper is based, was done in collaboration with Dr. C. B. Davis and Mr. G. A. Pacheco.

the muscles of the abdomen or extremities. These become more generalized, then coarser and more severe, and are followed by clonic and eventually tonic convulsions of increasing severity. Spasmodic contractions of the diaphragm also appear, and the animals die in from two to five hours after the beginning of the perfusion, usually after a severe convulsion.

During an experiment chloride is dialyzed from the blood and tissues. At the end there is often a marked lowering of the blood chloride. This hypochloremia may reach as low as 118 milligrams per 100 cubic centimeters of whole blood. The carbon dioxide combining power of the plasma falls and may become as low as ten volumes per cent. There is a moderate rise in the non-protein nitrogen, and a slight elevation of the urea concentration. The secretion of urine diminishes soon after the establishment of perfusion, and finally completely ceases. This subsequent anuria is a constant finding. Abel [8] has also noted that little or no urine was secreted during his vividiffusion experiments.

The development of the symptoms and the subsequent lethal effect are not associated with an hypoglycemia, since the terminal blood sugar varied between 242 and 284 milligrams per 100 cubic centimeters; in fact, it was higher than that found preceding the commencement of the perfusion. The possibility of hypoglycemia, however, was considered. To answer the question of hypoglycemic convulsions more precisely, particularly in regard to a possible depletion of the sugar reserves by dialysis, in fifteen experiments 0.12 per cent glucose, about the concentration normally present in the rabbit's blood, was added to the perfusion water. There was no appreciable effect upon the development of the usual symptoms or the ordinarily fatal outcome. The usual hypochloremia developed, as well as changes in the blood chemistry similar to those following the perfusion of distilled water alone, with this particular exception, that the terminal blood sugar became even higher; in one instance 320 milligrams per 100 cubic centimeters. There was little or no secretion of urine, and in most instances an anuria. In all thirty experiments definite hemolysis was observed. Demineralization occurred, to the extent of the diffusibility of the dialyzable electrolytes. There was also a loss of albuminous substance, washed out by the perfusing fluid. Further experiments were then devised in an attempt to evaluate these factors in so far as they might be causes of the development of the symptoms and of the ordinarily fatal outcome.

To overcome the effects of demineralization of the blood due to the dialysis of blood sodium, potassium, calcium and chloride ions into the perfusing distilled water, Ringer's solution with glucose (NaCl 0.7 per cent, KCl 0.03 per cent, $CaCl_2$ 0.025 per cent, glucose 0.143 per cent) was substituted and was perfused through the peritoneal cavity by the same methods. During the course of these experiments the animals showed no evidence of increased nervous irritability. There were no muscular twitchings, tremors or convulsions. The animals were alive and in good condition when perfusion was terminated at the end of eight or nine hours. The blood chloride at the end of an experiment was slightly higher than before the perfusion began. During these experiments there was a continuous secretion of urine. Usually this was at a normal even rate; however, in one animal a moderate diuresis ensued during the second hour of perfusion. There was some hemolysis, and albuminous substance was washed out by the perfusion fluid.

The relative importance of the individual ions was then considered. The potassium and calcium were first withdrawn from the perfusion fluid and 0.9 per cent pure sodium chloride substituted in place of Ringer's solution. In half the experiments, 0.12 per cent pure glucose was added. The sodium chloride used in making this solution, and in subsequent experiments, was the purest obtainable (Kahlbaum's), and contained no other ions. Four animals were alive and in good condition when perfusion was terminated at the end of 8, 8, 9, and 10 hours respectively. One animal, perfused with saline containing glucose, showed definite muscular twitchings and contractions. The others were quiet during the experiments. All four showed increased irritability at the end. During all experiments there was a continuous secretion of urine, and in one animal a moderate diuresis occurred. The whole blood chlorides at the end were higher than previous to the commencement of perfusion, averaging 546 milligrams per 100 cubic centimeters. The blood sugars were higher in the experiments in which glucose was used, averaging 191 milligrams per 100 cubic centimeters. There was a fall in the carbon dioxide combining power of the plasma, and a slight decrease in the N. P. N. and urea concentrations. The serum calcium fell, in one experiment, to 2.9 milligrams per 100 cubic centimeters. This animal showed no muscular twitchings, tremors or contractions and was quiet during the latter part of the perfusion. There was thus a *hypocalcemia* without tetany. There was a slight hemolysis.

An isotonic solution without electrolytes, 4.2 per cent pure glucose, was then used. Chloride is readily dialyzed from the blood into intraperitoneal glucose solutions.[11] In these experiments, increased respirations, muscular twitchings, tremors, and convulsions ensued. The picture, however, was not typical of the symptoms ordinarily following the perfusion of distilled water alone. The animals died in from 2½ to 7 hours. The terminal blood was hypochloremic, 136 milligrams per 100 cubic centimeters. There was an enormous rise in the blood sugar. Perfusion of an isotonic solution containing 0.45 per cent sodium chloride and 2.1 per cent glucose had no such lethal effect and the animal was alive when the

experiment was terminated at the end of 9½ hours. The terminal blood in this animal showed a slight rise in the chloride content and an enormous increase in the sugar concentration. Another animal was alive when the perfusion of a hypertonic solution, 0.9 per cent sodium chloride and 2.1 per cent glucose, was terminated at the end of eight hours.

Ringer's solution with glucose, but *without sodium chloride,* (KCl 0.03 per cent, $CaCl_2$ 0.025 per cent, glucose 0.143 per cent) was then used. In this manner adequate amounts of calcium and potassium were supplied during the perfusion, but no sodium and inadequate chloride, since by dialysis chlorides enter this hypotonic fluid from the blood stream. Increased respirations, muscular twitchings and convulsions ensued as the perfusion continued, and the animals died in between five and six hours. The hypochloremia which developed was not so marked as in the distilled water experiments, 181 milligrams per 100 cubic centimeters. The secretion of the urine diminished and then ceased. There was a definite hemolysis and a loss of albuminous substance in the perfusion fluid.

CONCLUSIONS

A consideration of the preceding experiments led to the hypothesis that the loss of chloride was an important factor in the development of the characteristic symptoms and the ordinarily fatal outcome following the perfusion of distilled water through the peritoneal cavity. Whether this might be due to the specific deficiency, or to some associated change, such as a lowering of the blood osmotic concentration, was not clear. The hypothesis was tested experimentally by supplying an adequate amount of pure sodium chloride alone to the blood stream throughout the transperitoneal perfusion with distilled water. This was accomplished by timed intravenous injections by means of the Woodyatt pump.

After a number of unsuccessful attempts, it was found best to inject a 2.5 per cent solution of pure sodium chloride at the rate of one cubic centimeter per minute into one of the cannulated jugular veins. When too concentrated solutions are used, for example, nine per cent, thrombosis occurs locally and in one animal was followed by pulmonary embolism. If the solution is too dilute, sodium chloride is not supplied as rapidly as it is dialyzed away; also too much water must be simultaneously injected.

When distilled water or distilled water with glucose is perfused through the peritoneal cavity, the muscular symptoms soon develop, and the effect is ordinarily fatal in from two to five hours, on an average in about three hours. However, by supplying adequate sodium chloride intravenously by this method, it was possible to keep one animal alive 17½ hours—five times as long as during the perfusion of distilled water alone. During the experiment there was an occasional mild muscular fibrillation. There were no severe tremors or no convulsions. A marked diuresis occurred, lasting about 12½ hours, but decreasing during the last five hours until the urinary secretion was slightly less than normal at the end of the experiment. There was a slight fall in the whole blood chloride, however, no hypochloremia as in the water-alone experiments. The plasma chloride was high. There was no tetany, although the serum calcium fell to 3.8 milligrams per 100 cubic centimeters. A definite hemolysis was present.

TABLE 1

	Blood before perfusion Mg. per 100 cc.	Blood at end of experiment Mg. per 100 cc.
NaCl	463	402
N. P. N.	37.5	40
Urea	14	21
Sugar	138	163
Plasma CO_2 capacity	45 cc. per 100 cc. plasma	22 cc. per 100 cc. plasma
Plasma NaCl	592	750
Serum Calcium	9.3	3.8

BLOOD CHEMISTRY CHANGES

The changes in the blood chemistry are best presented in Table 1.

Rabbit 2.5 kilograms. *Perfusion fluid,* distilled water with 0.12 per cent glucose; *Rate,* 500 cubic centimeters per hour. Simultaneous *intravenous injection* of 2.5 per cent pure sodium chloride at the rate of 1 cubic centimeter per minute. *Duration* 17½ hours.

In a subsequent experiment, the combined intravenous infusion and transperitoneal perfusion were similarly maintained for twelve hours without the development of symptoms. At the end of that time the intravenous injection of sodium chloride was stopped, but the perfusion of distilled water with glucose continued. Muscular twitchings then developed and became more severe; finally convulsions ensued and death followed after five hours of perfusion alone. In another experiment the simultaneous intravenous administration of Ringer's solution *without the sodium chloride* did not prevent the development of symptoms nor the lethal effect, and this animal died 5½ hours after the perfusion began.

SUMMARY

These experiments represent a study of certain of the effects of peritoneal dialysis, particularly in the production of experimental hypochloremia. It is difficult properly to evaluate, with the data at hand, the complex physico-chemical changes which result in the blood and tissues of the dialyzed animals. However, the experiments demonstrate the importance of sodium chloride to life and a state of well-being. In addition, from them may be deduced a rational explanation of the anuria accompanying the hypochloremia of intestinal obstruction.

University of Chicago.

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ASPIRATION IN TONSILLECTOMY—COMPARATIVE MERITS OF POSTURE AND OTHER FACTORS*

A BRONCHOSCOPIC STUDY OF ONE HUNDRED AND TEN PATIENTS

Research Prize Paper of the Fifty-Ninth Annual Session of the California Medical Association

By H. J. HARA, M. D.
Los Angeles

ONE-THIRD of all the surgical operations since 1924 among the American urban population are said to have been for the removal of tonsils and adenoids.[1] With the apparent increase of incidence of postoperative pulmonary complications, the problem of ascertaining the factors that might lead to the production of lung abscess merits earnest consideration.

In recent years much light has been shed on the etiology of postoperative complications. Concerning their causation, investigators in this field are now divided into two schools of thought: those who hold to the embolic, and those who defend the aspiration theories. That infecting emboli play a distinct part in some cases of lung abscess is well supported by both clinical and experimental evidences as shown by Cutler and Hunt,[2] Schlueter and Werdlein,[3] Fetterolf and Fox,[4] and many others. It is also true that under certain circumstances, the aspiration of infected material into the air passages contributes to the causation of lung abscess, a fact which is demonstrated by the works of Hoelscher,[5] Lemon,[6] Smith,[7] Crowe and Scarff,[8] Allen,[9] Ochsner and Nesbit,[10] Myerson,[11] Iglauer,[12] and recently by May and his associates.[13] A careful review of recent literature on this subject impresses one with the fact that the pendulum of medical thought is swaying toward the side of the aspiration theory.

* From the Department of Bronchoscopy, White Memorial Hospital, College of Medical Evangelists, Los Angeles.

Editors' Note.—This paper was submitted under the nom de plume, Rose Trendelenburg, and received the 1930 Research prize of $150 at the fifty-ninth annual session of the California Medical Association, Del Monte, April 28 to May 1, 1930. The name of the institution and other identifying references were lacking in the manuscript, but have been inserted by the editor.

Two prizes are awarded by the Association at each annual session—one for the best paper on a clinical subject, the other for the best paper on a research subject. Application to the central office of the Association will bring a leaflet which explains the requirements and rules governing the awards.

INCIDENCE

The first lung abscess following tonsillectomy in this country was reported in 1912 by Richardson.[14] Moore[15] estimated the incidence of lung abscess as once in 2500 to 3000 posttonsillectomies. That rate was based on a nation-wide survey by means of comprehensive queŝtionnaires sent out to various throat specialists. Moore thus assembled 202 cases of lung abscess most of which followed tonsillectomy, thirty-nine of the tonsillectomies having been done under local anesthesia. Cutler and Schlueter[16] collected from the literature a total of 1908 cases of pulmonary abscess; 29 per cent of these followed operative procedures, and of such 14.6 per cent occurred after the removal of tonsils. In a series of 602 cases of pulmonary abscess which were observed at the Mayo Clinic by Hedblom,[17] 146 followed operations. Of these operative cases, forty-eight occurred after tonsillectomy.

From the records at the Massachusetts General Hospital the writer collected sixty cases of pulmonary complications which were recorded in the period between May 1921 and October 1927. This series included forty-five lung abscesses, eight lobar pneumonias, four cases of bronchiectasis, and three cases of bronchopneumonia. All followed operations on the upper respiratory tract, chiefly on tonsils and adenoids under inhalation ether anesthesia. Of these sixty patients, thirty-nine were operated on elsewhere than at the Massachusetts General Hospital. When the complications later developed, the patients sought medical aid in the above hospital. The remaining twenty-one cases included two bronchopneumonias, eight lobar pneumonias, and eleven lung abscesses. These patients had been operated on either at the Massachusetts General Hospital or at the Massachusetts Charitable Eye and Ear Infirmary, these two institutions being under the same management. During this same period the average number of tonsillectomies performed each year in these two institutions was 3356. This places the actual known incidence of lung abscess in these two institutions as one in every 2678 tonsillectomies.

SCOPE OF EXPERIMENT

By means of bronchoscopic studies Myerson[10] and Iglauer[11] have shown that 40 to 77.5 per cent of patients, immediately following tonsillectomy under ether anesthesia, revealed the presence of blood and mucus in some portion of the bronchial tree. Iglauer reported that when tonsils were removed under local anesthesia, aspiration

took place in 28 to 30 per cent of cases, though with less quantity and penetration.

It is recognized that the normal tracheobronchial system, aside from its ciliary movement, cough reflex, and "peristaltic" action, has inherent tissue immunity against bacterial invasion from the upper respiratory tract. However, in the light of our present knowledge, should any aspirated blood become infected, where could one find more favorable conditions for a good culture medium?

The following studies were made in order to evaluate the various factors which contribute to the causation of aspiration complications.

CLINICAL MATERIAL

The series here reported consists of 110 patients, fifty-four males and fifty-six females, three to fourteen years of age, who came to the laryngological service at the White Memorial Clinic for the removal of tonsils and adenoids in

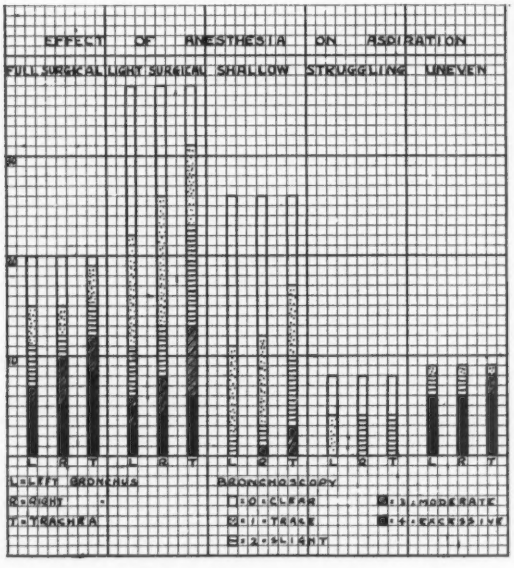


Chart 1-A.—Showing diagrammatically, the effects of different types of anesthesia on aspiration evidences in trachea and bronchi.

the period between April 1929 and January 1930. Each patient received preliminary physical and laboratory examinations, such as urinalysis and bleeding and coagulation times. When the patient gave a history of acute illness within the two weeks before the date set for operation, the operation was postponed and the patient was given a later appointment.

All operations were performed in the forenoon. Unless there was a contraindication, each patient was discharged the same evening, after a throat examination had been made. Each patient received a printed instruction card for the postoperative home care. When emergencies arose after a patient left the clinic, a house call was made by one of the staff on service. Each patient was asked to report to the clinic, when surgical convalescence seemed complete, for a final

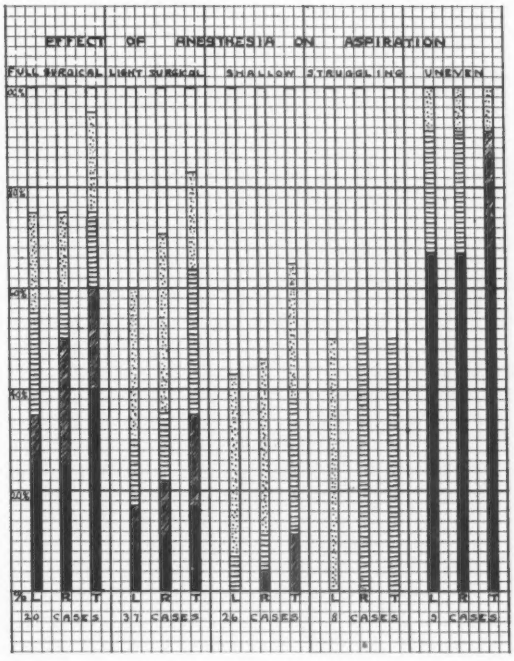


Chart 1-B.—Showing diagrammatically, the effects of different types of anesthesia on aspiration evidences, as noted in different patient groups.

check-up. About fifty patients did return to the clinic for this purpose. To those patients who failed to come back for the final examination, a social service worker was sent to ascertain the after-effects of the operation, with special reference to the presence of cough, fever, precardial pain, and other signs that might point to the presence of a pulmonary complication.

Tables 1 to 6 reveal the scope of the study and the various factors that were considered.

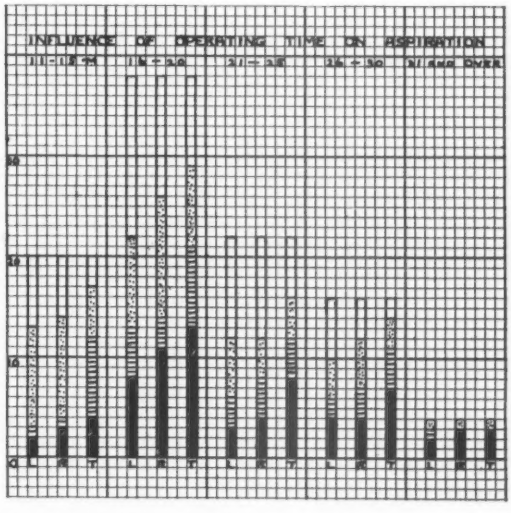


Chart 2-A.—Showing the influence of operative time on aspiration complications (in relation to the trachea and bronchi).

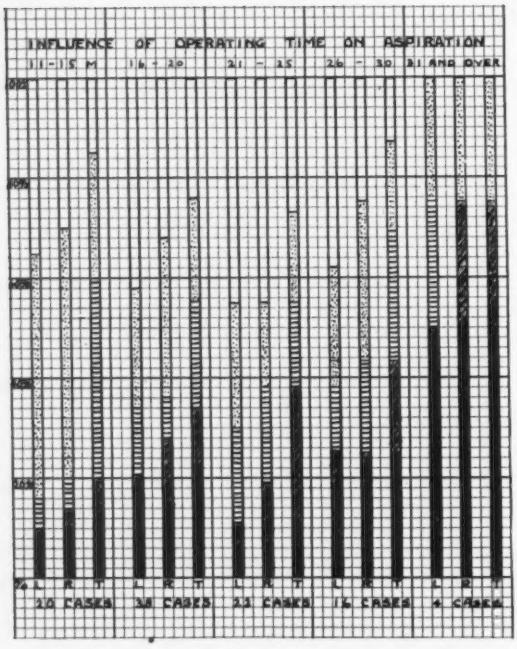


Chart 2-B.—Showing the influence of operative time on aspiration complications (in relation to certain patient groups).

When the bleeding was entirely controlled and the pharynx dry, a direct tracheobronchoscopy was performed by the writer. The contents of each main bronchus and of the trachea were noted and graded according to the amount of blood and mucus present. Where no blood was found it was recorded as zero (0), whereas when the secretion flowed out of the examining-tube mouth, it was designated as four (4). Between these two extremes the various amounts of the contents present were graded according to the number of uniform-sized sterilized sponges which were necessary to dry the air passages. There were forty-five different physician and student operators in this series of tonsillectomies. All used the dissection and snare method. The La Force adenotome was employed for adenoidectomies.

ETHER

The open cone method of inhalation anesthesia was employed at the beginning of each anesthesia. Just before the operation began, this was changed to compressed-air vaporization from which apparatus a rubber tube carried the ether to the angle of the patient's mouth. Earlier in the series the exact amount of ether used for each patient was noted, but it soon became apparent that the amount consumed was influenced by so many different factors that the amounts used were omitted from the final tabulations. The induction time was counted as from the beginning of etherization to the moment when the mouth gag was introduced.

The effects of anesthesia observed on the patients were recorded in five groups as follows: Full Surgical, Light Surgical, Shallow, Struggling, and Uneven (Charts 1-A and 1-B). To maintain a constant degree of anesthesia in a patient for any length of time requires considerable skill and experience. This is particularly so in a tonsillectomy operation, where the mouth is kept wide open and where suction also is used. In estimating the degree of narcosis we were guided by the general reaction of the patient throughout the operation.

It would seem that a shallow anesthesia is preferable to a full or to a light surgical one. Although struggling patients are at times difficult to manage, yet the frequency of aspiration complications seem to be less.

SUCTION

The usefulness of suction in the operation of the upper respiratory tract is universally recognized. In the series here reported, the water-suction tube was used and manipulated by an assistant. In patient 73, the suction was not used; nevertheless only a trace of blood was found in the trachea and none at all in the bronchi of the patient. In patients 83 and 100, each patient was operated on in the Rose position. Patient 83 had an unusually large quantity of blood in the lower air passages, but patient 100 had very little blood

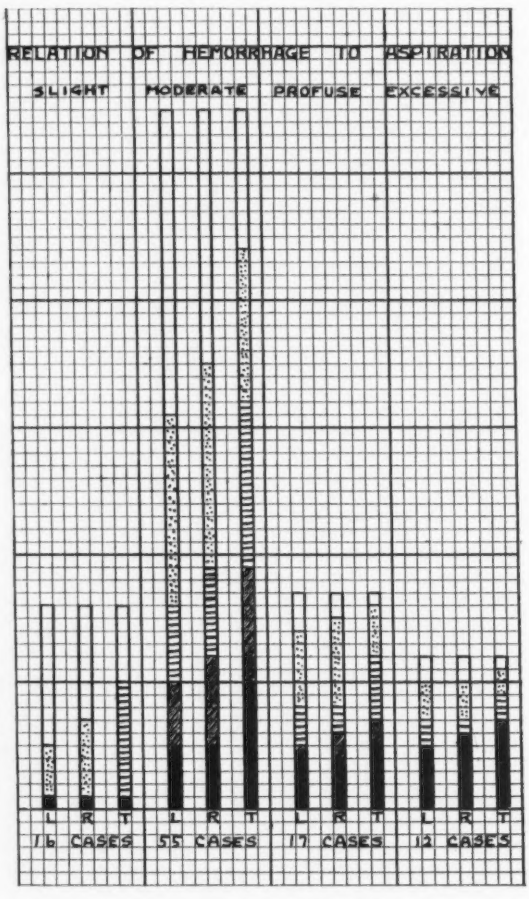


Chart 3-A.—Showing the relation of hemorrhage to injection of the air passages.

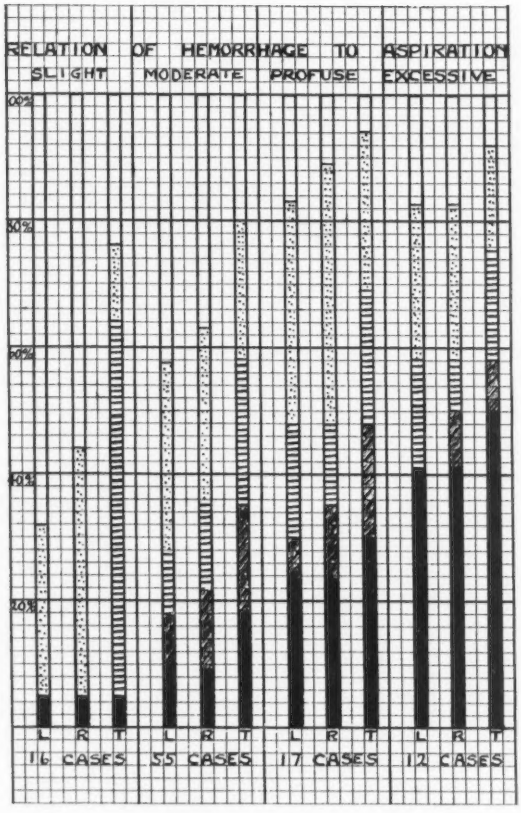


Chart 3-B.—Showing the relation of hemorrhage to the injection of the air passages.

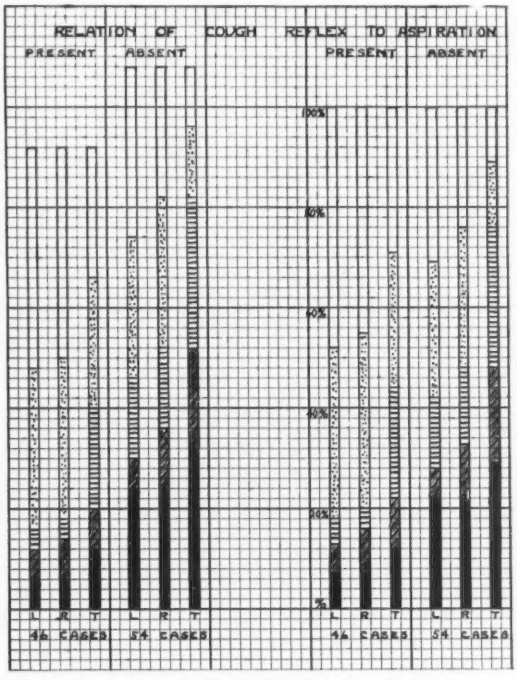


Chart 4.—Showing the relation of cough to aspiration.

or secretion. It is evident that suction has a place in tonsillectomy operations, but the belief that suction when constantly applied prevents the downward flow of pharyngeal contents seems to be erroneous.

OPERATING TIME

The influence of the operating time on aspiration complications is represented in Charts 2-A and 2-B. It would seem therefrom that the operating time had slight influence on the amount of aspiration. At least, the amount actually present within the air passages at the conclusion of the surgical procedures, whether long or short, was on the average the same.

HEMORRHAGE

A slight loss of blood is inevitable in tonsillectomy operations. According to the number of sponges required and the constancy of suction applied, the quantity lost was numerically estimated as follows: 1, slight; 2, moderate; 3, profuse; and 4, excessive.

Charts 3-A and 3-B show the relation of hemorrhage to the injection of the air passage.

COUGH AND VOMITING

Much has been written concerning the relation of the cough reflex to the incidence of aspiration under inhalation ether anesthesia. Experience has shown that the threshold of cough reflex is subject to considerable variation in different individuals. It would seem, however, that coughing does guard against aspiration of a large quantity of secretion and undoubtedly helps to clear the air passage by expelling that which finds its way downward. Chart 4 throws light on this.

Theoretically, a sudden regurgitation of the gastric contents into the pharynx immeasurably increases the danger of aspiration. It is well known, however, that the vomiting center is much earlier depressed by ether than is the cough reflex. Thus the action of the cough reflex doubtless often protects the air passages in patients where vomiting takes place. Of the thirty-seven patients who both vomited and coughed, seventeen had clean lungs, and ten had slight traces of blood.

POSTURE

This is the phase of the work on which our original classification was made. Six distinct postures of the head relative to the body were used. Five groups consisted of twenty patients each, and the sixth of ten patients. These postures are considered in turn.

Moderate Extension.—In this position the patient had no support of head other than the hands of the anesthetist who held it in moderate extension (Fig. 1).

Extreme Extension.—A small sand-bag was placed under the shoulders (Fig. 2). This caused extreme extension of head.

Trendelenburg at Twenty Degrees.—The foot of the operating table was elevated to form an angle of twenty degrees. A sand-bag supported the shoulders (Fig. 3).

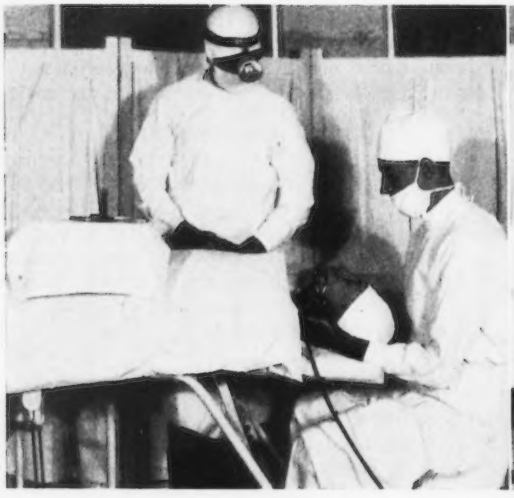


Fig. 1.—Moderate extension position.

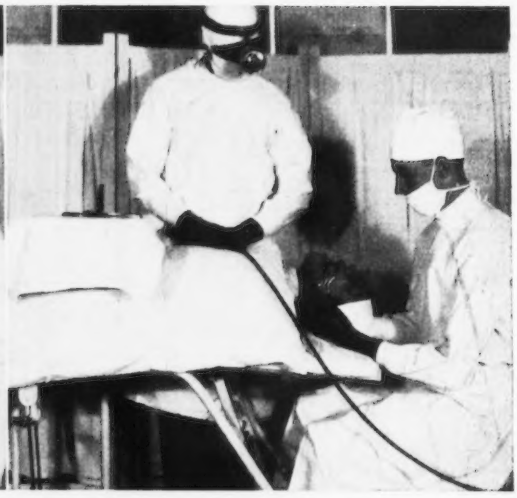


Fig. 2.—Extreme extension position.

Fig. 3.—Twenty degree Trendelenburg position.

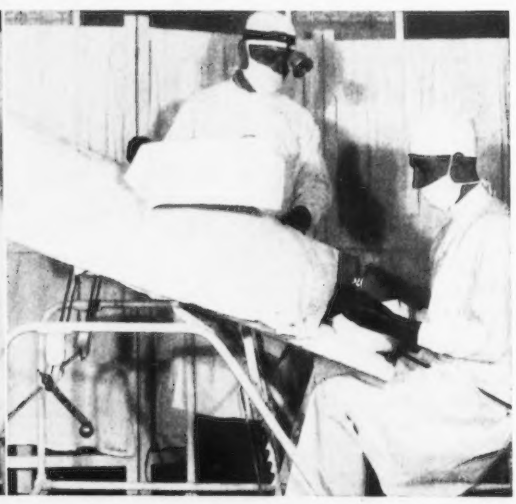


Fig. 4.—Forty-five degree Trendelenburg position.

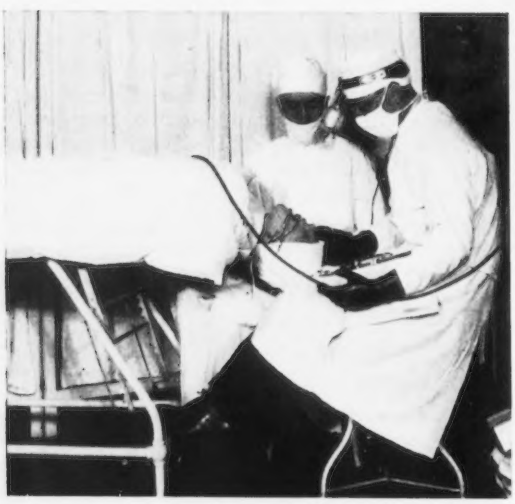


Fig. 5.—Rose position.

Fig. 6.—Bostonian position

Trendelenburg at Forty-Five Degrees.—This was like the preceding position except for extreme elevation of the foot of the table. It was necessary to strap the patient firmly to the table to prevent slipping toward the anesthetist (Fig. 4).

Rose Position.—The head of the patient was at the end of the operating table and the vertex supported by a pillow on the operator's lap. Thus the head was maintained on a much lower plane than the rest of the body (Fig. 5).

Bostonian.—As there were only ten patients in this group we did not include all the data in this study. However, it is none the less interesting from an academic viewpoint. For lack of a proper descriptive term we called the position shown in Fig. 6 the Bostonian. Practically all tonsillectomies in and about Boston are performed in this manner. After the patient is anesthetized he is strapped to a specially constructed chair for this purpose and brought into the operating room. Here he is placed before the surgeon in sitting posture. The trained nurse, who stands behind the patient, steadies the head and can readily turn or tip it in whichever direction indicated by the surgeon. Both the operator and the assistant have a free view of the field. Any advantages of position are apparently offset by the aspiration of blood and secretions which gravitate into the air passages in spite of care taken in the use of suction and sponges. The ten patients who were operated upon in this position had a uniformly large amount of blood (Chart 6). Aside from the climatic conditions and seasonable variations ascribed by Lord,[18] the unusually high incidence of pulmonary complications that occur following tonsillectomy in the city of Boston may, to some degree, be attributed to the use of this position.

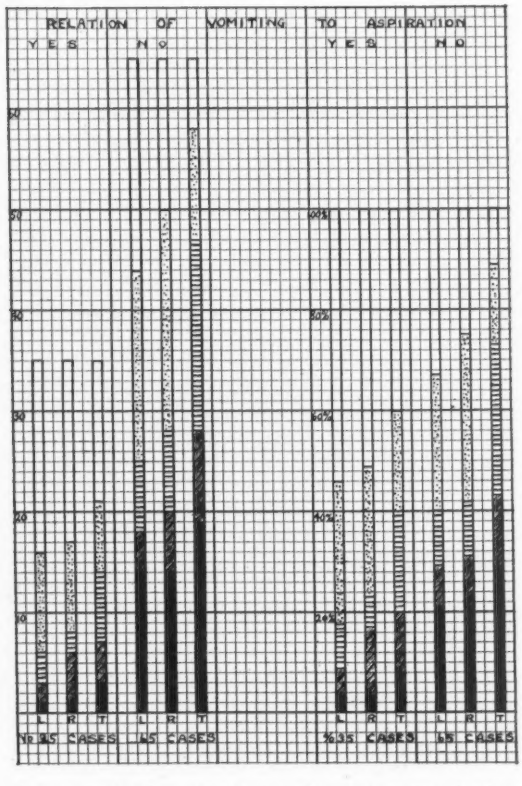


Chart 5.—Showing the relation of vomiting to aspiration.

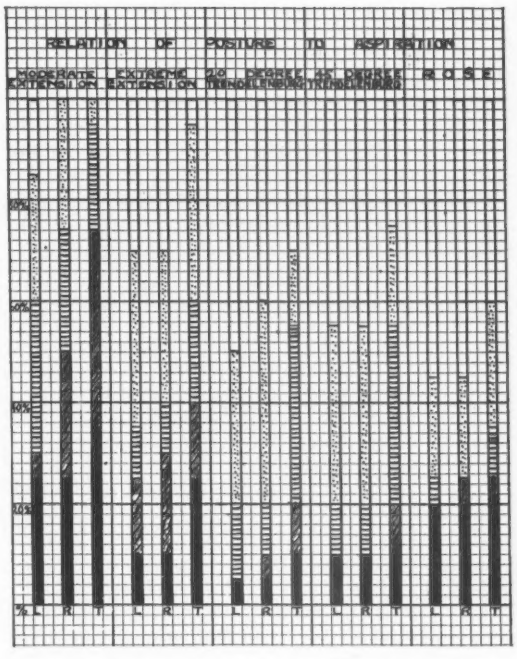


Chart 6.—Showing the relation of posture to aspiration.

The comparative merits of the various positions employed are graphically represented in Chart 6.

Table 7 indicates analysis of twenty-one cases, including seven patients who were operated on in Bostonian posture, in which there was excessive aspiration.

The analysis of thirty-two cases in which there was no blood or barely a trace of it in the lower air passages of the patients is shown in Table 8. A remarkable feature of this table is that there is included not a single case from either the moderate extension or Bostonian group.

SUMMARY

1. Bronchoscopic study immediately following operation seems to offer one of the best methods of the estimation of the amount of inspired blood and secretions present after a tonsillectomy operation.

2. The Rose position affords the greatest protection against aspiration. The next in order are: the Trendelenburg, the extreme extension, and the moderate extension. The Bostonian posture gave the largest amount of aspiration.

3. Anesthesia should be as light as is compatible with careful surgical manipulation. The deeper the narcosis the greater will be the amount of aspirated material.

4. Suction and dry sponges as at present used during tonsillectomy are useful armamentaria, but

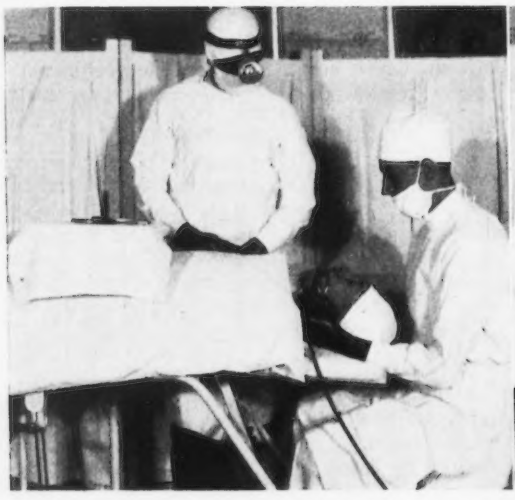


Fig. 1.—Moderate extension position.

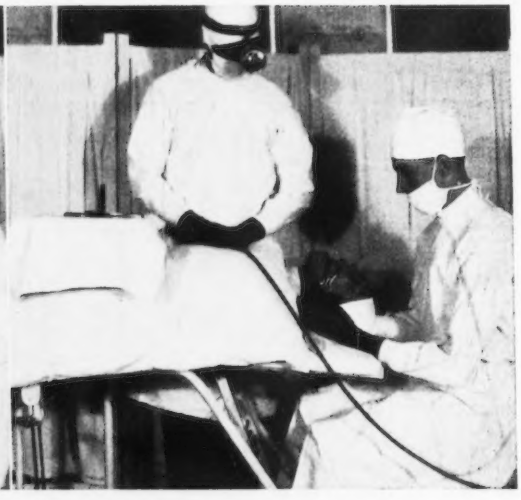


Fig. 2.—Extreme extension position.

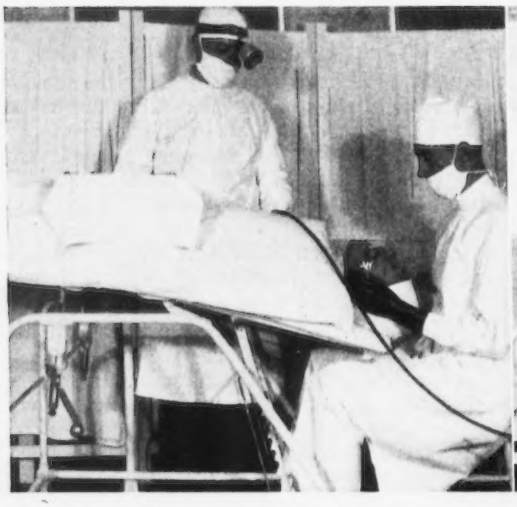
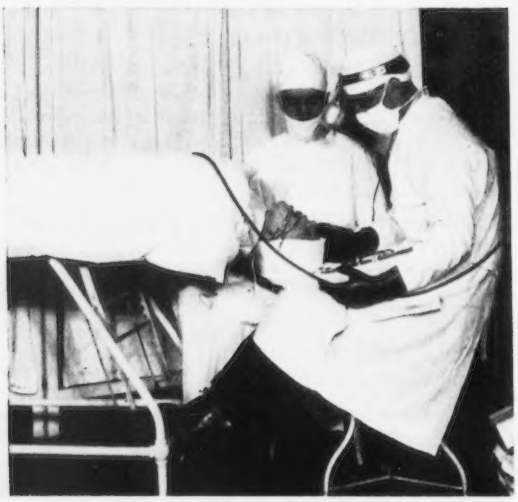


Fig. 3.—Twenty degree Trendelenburg position.

Fig. 4.—Forty-five degree Trendelenburg position.



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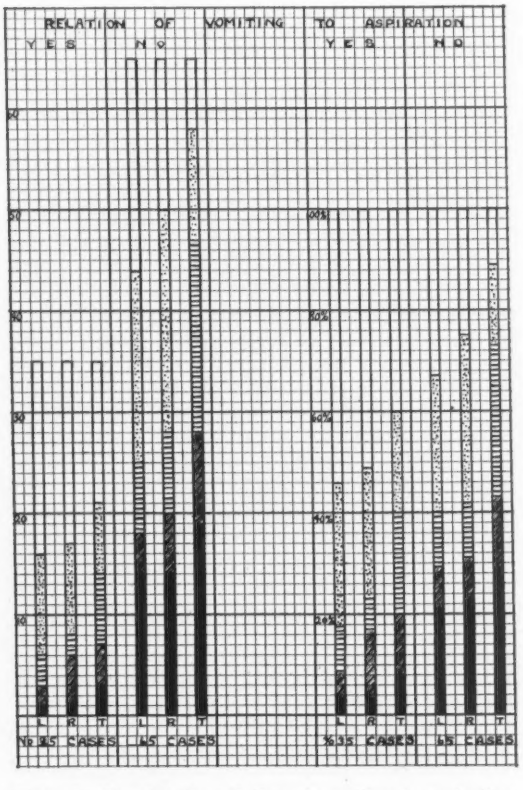

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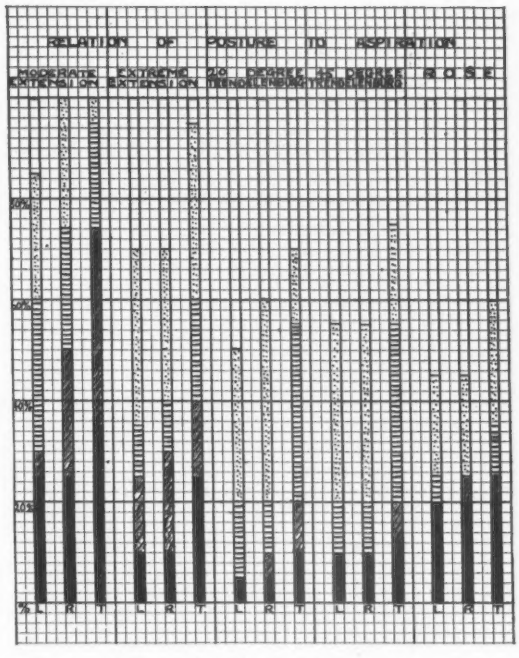

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4. Suction and dry sponges as at present used during tonsillectomy are useful armamentaria, but

TABLE 1.—*Moderate Extension*

No.	Name	Age	Sex	History	Induction Time	Degree of Anesthesia	Operators	Time	Hemorrhage	Suction Applied	Vomited	Coughed	Bronchoscopy Left	Bronchoscopy Right	Bronchoscopy Trachea
1	V. C.	13	M.	Repeated colds	25 M.	Shallow	F. H. L.	25 M.	2	Intermittent	Yes	No	2	3	3
2	O. L.	5	F.	Hypertrophic tonsils	5 M.	Shallow	C. C. H.	35 M.	3	Intermittent	Yes	Yes	2	3	3
3	S. P.	4	F.	Repeated colds	10 M.	Light surgical	J. W. H.	30 M.	2	Intermittent	No	No	2	2	3
4	B. R.	5	F.	Repeated colds	10 M.	Light surgical	T. W. K.	30 M.	1	Intermittent	No	No	0	1	2
5	I. L.	5	M.	O. M. S. A.	10 M.	Light surgical	W. C. C.	20 M.	2	Intermittent	No	No	0	1	2
6	I. L.	8	F.	Repeated colds	10 M.	Light surgical	W. C. C.	30 M.	2	Intermittent	No	No	1	2	3
7	E. P.	7	F.	"Colds"	10 M.	Light surgical	T. E. W.	28 M.	2	Intermittent	No	No	0	1	2
8	J. H.	8	F.	"Running nose"	10 M.	Light surgical	C. C. P.	34 M.	2	Intermittent	No	No	1	1	1
9	E. B.	9	M.	Septic tonsils	9 M.	Light surgical	J. W. H.	11 M.	4	Intermittent	No	No	4	4	4
10	W. C.	8	M.	Nasal obstruction	10 M.	Light surgical	J. W. H.	16 M.	4	Intermittent	No	No	2	2	3
11	R. C.	6	M.	Nasal obstruction	6 M.	Light surgical	C. S. I.	15 M.	2	Intermittent	No	No	1	2	3
12	H. B.	7	M.	Nasal obstruction	4 M.	Full surgical	C. S. I.	20 M.	4	Intermittent	No	No	2	3	4
13	R. R.	12	F.	Chronic tonsillitis	6 M.	Light surgical	C. S. I.	24 M.	2	Intermittent	No	No	2	2	3
14	E. A.	7	F.	Chronic tonsillitis	10 M.	Light surgical	R. T. H.	17 M.	2	Constant	Yes	Yes	3	3	4
15	R. O.	4	M.	Repeated colds	6 M.	Full surgical	C. B.	32 M.	2	Constant	No	No	4	4	4
16	T. H.	4	M.	Repeated colds	5 M.	Light surgical	M. E. C.	28 M.	2	Intermittent	No	No	4	4	4
17	A. A.	3	M.	Repeated sore throat	8 M.	Shallow	T. E. G.	22 M.	2	Constant	Yes	Yes	1	2	3
18	A. D.	5	F.	Nasal obst. O. M. C. A.	8 M.	Light surgical	E. B. C.	20 M.	2	Constant	No	No	4	4	4
19	C. M.	9	M.	Nasal obstruction	10 M.	Light surgical	J. H.	20 M.	3	Constant	No	Yes*	4	4	4
20	D. S.	5	M.	Chronic tonsillitis	14 M.	Struggling	M. E. C.	15 M.	3	Intermittent	No	Yes	1	1	2

* Yes, at beginning.
M—Minutes.

Hemorrhage
1—Slight. 3—Profuse.
2—Moderate. 4—Excessive

Bronchoscopy
0—Clear. 2—Slight.
1—Trace. 3—Moderate.
4—Excessive.

TABLE 2.—*Extreme Extension*

No.	Name	Age	Sex	History	Induction Time	Degree of Anesthesia	Operators	Time	Hemorrhage	Suction Applied	Vomited	Coughed	Bronchoscopy Left	Bronchoscopy Right	Bronchoscopy Trachea
21	A. M.	7	F.	Continuous colds	12 M.	Light surgical	W. G. H.	30 M.	1	Intermittent	No	Yes*	0	0	1
22	S. B.	8	F.	"Underweight"	10 M.	Shallow	H. J. H.	20 M.	2	Intermittent	Yes	Yes	1	1	2
23	W. R.	3	M.	Repeated colds	10 M.	Full surgical	M. A. D.	24 M.	2	Intermittent	No	No	1	2	3
24	J. C.	8	F.	Hypertrophic tonsils	8 M.	Full surgical	R. B. G.	19 M.	2	Intermittent	No	No	3	3	4
25	M. M.	8	F.	Repeated sore throats	8 M.	Full surgical	C. B.	27 M.	3	Constant	No	No	4	4	4
26	R. M.	10	M.	Impaired hearing	18 M.	Full surgical	L. L. H.	12 M.	2	Constant	No	No	2	3	3
27	V. C.	6	F.	Repeated sore throat	12 M.	Shallow	H. H. H.	28 M.	4	Constant	No	Yes	1	1	2
28	R. C.	7	M.	Nasal obstruction	17 M.	Light surgical	L. C. C.	16 M.	2	Constant	No	No	1	1	2
29	H. S.	7	M.	Repeated sore throat	20 M.	Full surgical	C. B.	21 M.	2	Constant	No	No	1	1	2
30	M. C.	14	F.	Hypertrophic tonsils	10 M.	Light surgical	S. K. B.	20 M.	2	Constant	Yes*	No	0	0	0
31	L. M.	11	F.	Chronic follicular tonsils	10 M.	Light surgical	E. B. C.	20 M.	2	Constant	No	No	1	1	2
32	D. G.	6	M.	"Slow mental development"	19 M.	Light surgical	H. H. L.	26 M.	2	Intermittent	No	No	3	3	4
33	M. F.	13	F.	Chronic naso-pharyngitis	7 M.	Shallow	T. E. G.	13 M.	2	Constant	Yes	Yes	0	0	1
34	C. Mc.	7	M.	Chronic hypertrophic tonsils	20 M.	Light surgical	S. K. B.	20 M.	2	Constant	No	No	0	0	1
35	R. O.	14	F.	Referred by school doctor	25 M.	Uneven (elec. trouble)	H. J. H.	20 M.	4	Intermittent	No	Yes†	4	4	4
36	R. N.	5	M.	Repeated sore throat	15 M.	Shallow	L. L. H.	20 M.	3	Constant	Yes	Yes	0	0	1
37	M. Mc.	5	F.	Septic tonsillitis	15 M.	Uneven	I. W. K.	20 M.	2	Constant	Yes	Yes	1	1	1
38	M. W.	12	F.	Repeated sore throat	15 M.	Light surgical	J. B. P.	17 M.	4	Constant	No	Yes*	1	1	1
39	S. J.	12	M.	Chronic tonsillitis, possible tuberculosis	13 M.	Light surgical	G. K.	19 M.	3	Constant	No	Yes*	3	3	4
40	M. E.	6	F.	Enlarged tonsils. O. M. C. A.	12 M.	Light surgical	H. J. H.	12 M.	2	Constant	No	Yes*	0	0	1

* Yes, at beginning.
† Yes, toward end.

TABLE 3.—*Trendelenburg, Twenty Degrees*

No.	Name	Age	Sex	History	Induction Time	Degree of Anesthesia	Operators	Time	Hemorrhage	Suction Applied	Vomited	Coughed	Bronchoscopy Left	Bronchoscopy Right	Bronchoscopy Trachea
41	N. A.	6	F.	Sore throats	10 M.	Shallow	H. J. H.	12 M.	3	Intermittent	No	Yes	1	1	2
42	N. B.	5	M.	Enlarged tonsils. Sinusitis	7 M.	Light surgical	H. H. H.	21 M.	2	Intermittent	Yes†	No	3	3	4
43	C. B.	9	M.	Repeated sore throat	14 M.	Full surgical	H. H. H.	24 M.	4	Intermittent	No	No	4	4	4
44	C. C.	3	M.	Septic tonsils	6 M.	Full surgical	H. H. H.	16 M.	3	Intermittent	No	No	0	1	1
45	J. B.	6	M.	Nasal obstruction. Repeated colds	16 M.	Shallow	H. J. H.	12 M.	2	Intermittent	Yes†	Yes	0	0	0
46	A. M.	6	F.	Nasal obstruction. Repeated colds	15 M.	Struggling	J. J. J.	22 M.	3	Constant	Yes	Yes	1	1	2
47	A. A.	6	M.	Bilat. sinusitis. Septic tonsils	10 M.	Struggling	F. E. I.	15 M.	4	Constant	Yes	Yes	1	1	2
48	J. O.	3	F.	Repeated colds	10 M.	Struggling	R. T. H.	11 M.	2	Constant	No	No	1	1	2
49	O. P.	3	F.	Enlarged tonsils	10 M.	Full surgical	H. H. H.	20 M.	3	Constant	No	No	4	4	4
50	N. N.	5	F.	Repeated colds	15 M.	Light surgical	G. McC.	28 M.	1	Intermittent	No	No	0	0	1
51	E. H.	6	F.	Repeated colds	15 M.	Shallow	H. F. E.	28 M.	2	Intermittent	No	Yes	3	3	4
52	J. G.	5	F.	Repeated colds	15 M.	Light surgical	H. J. H.	16 M.	1	Intermittent	No	No	0	1	2
53	M. S.	8	M.	Nasal obstruction	10 M.	Struggling	H. J. H.	20 M.	1	Intermittent	Yes	Yes	0	0	0
54	J. C.	10	M.	Chronic tonsillitis	9 M.	Struggling	J. B. O.	24 M.	1	Intermittent	Yes	Yes	0	0	0
55	F. M.	7	M.	Nasal obstruction. Cont. colds	7 M.	Full surgical	J. D. L.	13 M.	1	Intermittent	No	No	1	1	2
56	E. P.	7	M.	Nasal obstruction	10 M.	Light surgical	J. B. O.	18 M.	1	Intermittent	No	No	1	1	2
57	H. R.	5	M.	Dysphagia	9 M.	Struggling	E. W. G.	18 M.	1	Intermittent	Yes	Yes	0	0	0
58	J. G.	5	M.	Repeated colds	9 M.	Shallow	E. W. G.	15 M.	1	Intermittent	Yes	Yes	0	0	0
59	W. M.	7	M.	Nasal obstruction	9 M.	Shallow	E. W. G.	19 M.	1	Intermittent	Yes	Yes	0	0	0
60	E. S.	13	M.	Nasal obstruction. Repeated sore throat	11 M.	Shallow	H. J. H.	11 M.	2	Intermittent	Yes	Yes	0	1	1

† Yes, toward the end.

TABLE 4.—*Trendelenburg, Forty-Five Degrees*

No.	Name	Age	Sex	History	Induction Time	Degree of Anesthesia	Operators	Time	Hemorrhage	Suction Applied	Vomited	Coughed	Bronchoscopy Left	Bronchoscopy Right	Bronchoscopy Trachea
61	J. C.	6	M.	Nasal obstruction	10 M.	Light surgical	H. J. H.	11 M.	2	Constant	Yes	Yes*	1	1	2
62	A. K.	4	M.	Repeated sore throat	5 M.	Shallow	E. W. G.	23 M.	3	Constant	Yes	Yes	1	1	2
63	A. M.	11	F.	Repeated quinsy	12 M.	Shallow	E. W. G.	20 M.	2	Constant	Yes	Yes	0	0	0
64	E. B.	13	F.	Repeated headache	8 M.	Shallow	E. W. G.	18 M.	3	Constant	Yes	Yes	0	0	0
65	W. H.	6	M.	Repeated sore throat	5 M.	Shallow	E. W. G.	15 M.	1	Constant	Yes	Yes	0	0	0
66	B. G.	10	F.	Repeated sore throat	11 M.	Light surgical	E. W. G.	12 M.	2	Constant	Yes	Yes*	1	1	2
67	B. C.	5	F.	Repeated colds	6 M.	Light surgical	H. J. H.	16 M.	2	Constant	No	No	0	0	0
68	L. M.	7	F.	Repeated colds	8 M.	Light surgical	M. A. D.	22 M.	2	Constant	No	No	0	0	1
69	M. G.	10	F.	Repeated sore throat	11 M.	Light surgical	H. H. H.	21 M.	2	Constant	Yes	No	1	1	2
70	S. T.	6	M.	Frequent epistaxis	5 M.	Light surgical	C. T. H.	28 M.	2	Constant	No	No	1	1	2
71	E. R.	9	F.	Suppurative otitis med. Pansinusitis	16 M.	Shallow	R. B. G.	25 M.	2	Constant	Yes	Yes	0	0	0
72	M. M.	10	F.	Repeated colds	15 M.	Full surgical	H. J. H.	15 M.	2	Constant	No	No	0	0	1
73	M. J.	7	M.	Nasal obstruction. Catarrhal otitis	10 M.	Shallow	H. J. H.	20 M.	2	Out of commis'n	Yes‡	Yes†	0	0	1
74	S. H.	4	M.	Nasal obstruction	12 M.	Uneven	D. B. M.	11 M.	3	Intermittent	No	No	4	4	4
75	A. B.	12	F.	Repeated colds	10 M.	Uneven	P. L.	20 M.	3	Intermittent	Yes	Yes	2	2	3
76	A. C.	7	F.	Chronic tonsillitis	10 M.	Full surgical	D. B. M.	20 M.	1	Intermittent	No	No	0	0	2
77	I. V.	8	M.	Repeated colds	12 M.	Uneven	G. K.	18 M.	2	Intermittent	No	No	2	2	3
78	P. T.	3	F.	O. M. C. C. Enlarged tonsils	10 M.	Full surgical	G. K.	20 M.	1	Intermittent	No	No	1	1	2
79	R. F.	4	F.	Repeated colds	10 M.	Uneven	D. B. M.	20 M.	1	Intermittent	No	No	4	4	4
80	M. H.	6	M.	Repeated colds	5 M.	Full surgical	O. L. K.	21 M.	1	Intermittent	No	No	1	1	2

* Yes, at the beginning.
†Yes, toward the end.
‡ Yes, at the end.

TABLE 5.—*Rose Position*

No.	Name	Age	Sex	History	Induction Time	Degree of Anesthesia	Operators	Time	Hemorrhage	Suction Applied	Vomited	Coughed	Bronchoscopy Left	Bronchoscopy Right	Bronchoscopy Trachea
81	R. H.	9	F.	Enlarged tonsils	8 M.	Light surgical	H. T. H.	13 M.	2	Intermittent	No	No	0	0	0
82	G. Z.	12	M.	Enlarged tonsils	4 M.	Full surgical	F. M. B.	34 M.	2	Intermittent	No	No	4	4	4
83	W. F.	7	M.	Nasal obstruction. Impaired hearing	7 M.	Uneven	F. M. B.	42 M.	4§	Out of commis'n	No	No	4	4	4
84	B. D.	7	M.	Nasal obstruction	6 M.	Full surgical	F. M. B.	19 M.	3	Intermittent	No	No	2	2	3
85	V. S.	11	M.	Repeated colds. Nasal obstruction	8 M.	Shallow	F. M. B.	11 M.	2	Intermittent	No	Yes†	1	1	2
86	C. P.	4	F.	Bil. suppurative. Otitis M. chronic	3 M.	Shallow	C. T. H.	27 M.	2	Constant	Yes†	Yes	0	0	0
87	E. P.	11	F.	Chronic tonsillitis	12 M.	Light surgical	C. T. H.	20 M.	2	Constant	No	No	0	0	0
88	S. R.	6	F.	Nasal obstruction	8 M.	Full surgical	C. T. H.	23 M.	2	Intermittent	No	No	0	0	1
89	G. R.	8	F.	Referred by school nurse	5 M.	Struggling	T. H.	22 M.	2	Intermittent	Yes	Yes	0	0	0
90	R. P.	14	F.	Chronic tonsillitis	10 M.	Shallow	T. H.	28 M.	2	Intermittent	Yes	Yes	0	0	1
91	H. J.	10	M.	Neuritis of knees	10 M.	Light surgical	T. H.	25 M.	2	Constant	No	Yes‡	0	0	0
92	Y. N.	6	F.	Nasal obstruction. Repeated sore throat	7 M.	Light surgical	J. J. J.	21 M.	2	Constant	No	No	0	0	0
93	C. R.	11	F.	Repeated head colds. Tonsillitis	7 M.	Shallow	J. J. J.	23 M.	4	Constant	No	Yes†	0	0	1
94	R. K.	5	M.	Enlarged tonsils	13 M.	Uneven	G. L. C.	25 M.	2	Constant	Yes	Yes†	4	4	4
95	A. P.	6	M.	Peritonsillar abscess	13 M.	Full surgical	F. E. I.	27 M.	4	Constant	No	No	0	0	0
96	G. R.	12	F.	Bil. suppurative. Chronic otitis media	10 M.	Full surgical	O. L. K.	20 M.	4	Constant	No	No	4	4	4
97	O. S.	9	M.	Chronic foll. tonsil	13 M.	Uneven	H. J. H.	20 M.	2	Intermittent	No	Yes	1	1	2
98	E. A.	6	M.	Nasal obstruction	17 M.	Shallow	W. M.	21 M.	2	Intermittent	Yes	Yes	0	0	1
99	L. T.	11	F.	Repeated colds. Impaired hearing	15 M.	Light surgical	E. S. M.	27 M.	3	Intermittent	Yes	Yes	1	1	1
100	A. H.	5	F.	Enlarged tonsils	10 M.	Shallow	O. L. K.	12 M.	3	Out of commis'n	No	Yes	1	1	1

† Yes, toward the end.
‡ Yes, at the end.
§ Sutures taken.

TABLE 6.—*Bostonian Position*

No.	Name	Age	Sex	History	Induction Time	Degree of Anesthesia	Operators	Time	Hemorrhage	Suction Applied	Vomited	Coughed	Bronchoscopy Left	Bronchoscopy Right	Bronchoscopy Trachea
101	R. P.	5	F.	Otitis med. Suppurat. chronic	8 M.	Light surgical	R. I. H.	20 M.	1	Constant	No	Yes†	4	4	4
102	H. M.	8	F.	Nasal obstruction	10 M.	Full surgical	G. L. C.	26 M.	2	Intermittent	No	No	4	4	4
103	L. R.	6	F.	Repeated sore throat	9 M.	Full surgical	R. B. G.	18 M.	2	Intermittent	No	No	4	4	4
104	A. R.	4	M.	Repeated sore throat	7 M.	Full surgical	R. I. H.	15 M.	2	Intermittent	No	No	4	4	4
105	E. C.	7	F.	Nasal obstruction	6 M.	Light surgical	R. I. H.	18 M.	2	Constant	No	No	2	2	3
106	C. C.	10	M.	Nasal obstruction	18 M.	Full surgical	R. E. G.	22 M.	2	Constant	No	No	4	4	4
107	J. M.	7	M.	Nasal obstruction	15 M.	Shallow	G. L. C.	18 M.	2	Constant	Yes	Yes	2	2	3
108	F. S.	8	F.	Nasal obstruction	13 M.	Light surgical	F. E. I.	24 M.	2	Intermittent	No	No	2	2	3
109	F. H.	11	M.	Otitis media. Suppurative chronic	7 M.	Light surgical	H. J. H.	17 M.	2	Constant	No	No	4	4	4
110	R. S.	6	M.	Nasal obstruction	15 M.	Light surgical	E. K.	25 M.	1	Intermittent	No	No	4	4	4

† Yes, toward the end.

TABLE 7.—*Analysis of Excessively Aspirated Patients*

Case	Name	Age	Sex	Positions	Induction Time	Degree of Anesthesia	Operators	Time	Hemorrhage	Suction Applied	Vomited	Coughed	Bronchoscopy L	R	T
9	E. B.	9	M.	Moderate extension	9 M.	Light surgical	J. W. H.	11 M.	4	Intermittent	No	No	4	4	4
15	R. Q.	4	M.	Moderate extension	6 M.	Full surgical	C. B.	32 M.	2	Constant	No	No	4	4	4
16	T. H.	4	M.	Moderate extension	5 M.	Light surgical	M. E. C.	28 M.	2	Intermittent	No	No	4	4	4
18	A. D.	5	F.	Moderate extension	4 M.	Light surgical	E. B. C.	20 M.	2	Constant	No	No	4	4	4
19	C. M.	9	M.	Moderate extension	10 M.	Light surgical	J. H.	20 M.	3	Constant	No	Yes*	4	4	4
35	R. O.	14	F.	Extreme extension	25 M.	Uneven. Out of commis'n	H. J. H.	20 M.	4	Intermittent	No	Yes‡	4	4	4
43	C. B.	9	M.	Trendelenburg 20 degree	14 M.	Full surgical	H. H. H.	24 M.	4	Intermittent	No	No	4	4	4
49	O. P.	3	F.	Trendelenburg 20 degree	10 M.	Full surgical	H. H. H.	20 M.	3	Constant	No	No	4	4	4
74	S. H.	4	M.	Trendelenburg 45 degree	12 M.	Uneven	D. B. M.	11 M.	3	Intermittent	No	No	4	4	4
79	R. F.	4	F.	Trendelenburg 45 degree	10 M.	Uneven	D. B. M.	20 M.	1	Intermittent	No	No	4	4	4
82	G. Z.	12	M.	Rose	4 M.	Full surgical	F. M. B.	34 M.	2	Intermittent	No	No	4	4	4
83	W. F.	7	M.	Rose	7 M.	Uneven	F. M. B.	42 M.	4§	Out of commis'n	No	No	4	4	4
94	R. K.	5	M.	Rose	13 M.	Uneven	G. L. C.	25 M.	2	Constant	Yes	Yes†	4	4	4
96	G. R.	12	F.	Rose	10 M.	Full surgical	O. L. K.	20 M.	4	Constant	No	No	4	4	4
101	R. P.	5	F.	Bostonian	8 M.	Light surgical	R. I. H.	20 M.	1	Constant	No	Yes†	4	4	4
102	H. M.	8	F.	Bostonian	10 M.	Full surgical	G. L. C.	26 M.	2	Intermittent	No	No	4	4	4
103	L. R.	6	F.	Bostonian	9 M.	Full surgical	R. B. G.	18 M.	2	Intermittent	No	No	4	4	4
104	A. R.	4	M.	Bostonian	7 M.	Full surgical	R. I. H.	15 M.	2	Intermittent	No	No	4	4	4
106	C. C.	10	M.	Bostonian	18 M.	Full surgical	R. E. G.	22 M.	2	Constant	No	No	4	4	4
109	F. H.	11	M.	Bostonian	7 M.	Light surgical	H. J. H.	17 M.	2	Constant	No	No	4	4	4
110	R. S.	6	M.	Bostonian	15 M.	Light surgical	E. K.	25 M.	1	Intermittent	No	No	4	4	4

* Yes, at the beginning. ‡ Yes, at the end.
† Yes, toward the end. § Sutures taken.

TABLE 8.—*Analysis of Non- and Slightly Aspirated Patients*

Case	Name	Age	Sex	Positions	Induction Time	Degree of Anesthesia	Operators	Time	Hemorrhage	Suction Applied	Vomited	Coughed	Bronchoscopy L	R	T
21	A. M.	7	F.	Extreme extension	12 M.	Light Surgical	W. G. H.	30 M.	1	Intermittent	No	Yes	0	0	1
30	M. C.	14	F.	Extreme extension	10 M.	Light Surgical	S. K. B.	20 M.	2	Constant	Yes	No	0	0	0
33	M. F.	13	F.	Extreme extension	7 M.	Shallow	T. E. G.	13 M.	2	Constant	Yes	Yes	0	0	1
34	C. M.	7	M.	Extreme extension	20 M.	Light Surgical	S. K. B.	20 M.	2	Constant	No	No	0	0	1
36	R. N.	5	M.	Extreme extension	15 M.	Shallow	L. L. H.	20 M.	3	Constant	Yes	Yes	0	0	1
40	M. E.	6	F.	Extreme extension	12 M.	Light Surgical	H. J. H.	12 M.	2	Constant	No	Yes	0	0	1
45	J. B.	6	M.	Trendelenburg 20 degree	16 M.	Shallow	H. J. H.	12 M.	2	Intermittent	Yes†	Yes	0	0	0
50	N. N.	5	F.	Trendelenburg 20 degree	15 M.	Light Surgical	G. McC.	28 M.	1	Intermittent	No	No	0	0	1
53	M. S.	8	M.	Trendelenburg 20 degree	10 M.	Struggling	H. J. H.	20 M.	1	Intermittent	Yes	Yes	0	0	0
54	J. C.	10	M.	Trendelenburg 20 degree	9 M.	Struggling	J. B. O.	24 M.	1	Intermittent	Yes	Yes	0	0	0
57	H. R.	5	M.	Trendelenburg 20 degree	9 M.	Struggling	E. W. G.	18 M.	1	Intermittent	Yes	Yes	0	0	0
58	J. G.	5	M.	Trendelenburg 20 degree	9 M.	Shallow	E. W. G.	19 M.	1	Intermittent	Yes	Yes	0	0	0
59	W. M.	7	M.	Trendelenburg 20 degree	9 M.	Shallow	E. W. G.	19 M.	1	Intermittent	Yes	Yes	0	0	0
63	A. M.	11	F.	Trendelenburg 45 degree	12 M.	Shallow	E. W. G.	20 M.	2	Constant	Yes	Yes	0	0	0
64	E. B.	13	F.	Trendelenburg 45 degree	8 M.	Shallow	E. W. G.	18 M.	3	Constant	Yes	Yes	0	0	0
65	W. H.	6	M.	Trendelenburg 45 degree	5 M.	Shallow	E. W. G.	15 M.	1	Constant	Yes	Yes	0	0	0
67	B. C.	5	F.	Trendelenburg 45 degree	6 M.	Light Surgical	H. J. H.	16 M.	2	Constant	No	No	0	0	0
68	L. M.	7	F.	Trendelenburg 45 degree	8 M.	Light Surgical	M. A. O.	22 M.	2	Constant	No	No	0	0	1
71	E. R.	9	F.	Trendelenburg 45 degree	16 M.	Shallow	R. B. G.	25 M.	2	Constant	Yes	Yes	0	0	0
72	M. M.	10	F.	Trendelenburg 45 degree	15 M.	Full surgical	H. J. H.	15 M.	2	Constant	No	No	0	0	1
73	M. J.	7	M.	Trendelenburg 45 degree	10 M.	Shallow	H. J. H.	20 M.	2	Out of commis'n	Yes†	Yes†	0	0	1
81	R. H.	9	F.	Rose	8 M.	Light Surgical	H. J. H.	13 M.	2	Intermittent	No	No	0	0	0
86	C. P.	4	F.	Rose	3 M.	Shallow	C. T. H.	27 M.	2	Constant	Yes†	Yes	0	0	0
87	E. P.	11	F.	Rose	12 M.	Light Surgical	C. T. H.	20 M.	2	Constant	No	No	0	0	0
88	S. R.	6	F.	Rose	8 M.	Full surgical	C. T. H.	23 M.	2	Intermittent	No	No	0	0	1
89	G. R.	8	F.	Rose	5 M.	Struggling	T. H.	22 M.	2	Intermittent	Yes	Yes	0	0	0
90	R. P.	14	F.	Rose	10 M.	Shallow	T. H.	28 M.	2	Intermittent	Yes	Yes	0	0	1
91	H. J.	10	M.	Rose	10 M.	Light Surgical	T. H.	25 M.	2	Constant	No	Yes‡	0	0	0
92	Y. N.	6	F.	Rose	7 M.	Light Surgical	J. J. J.	21 M.	2	Constant	No	No	0	0	0
93	C. R.	11	F.	Rose	7 M.	Shallow	J. J. J.	23 M.	4	Constant	No	Yes†	0	0	1
95	A. P.	6	M.	Rose	13 M.	Full surgical	F. E. I.	27 M.	4	Constant	No	No	0	0	0
98	E. A.	6	M.	Rose	17 M.	Shallow	W. M.	21 M.	2	Intermittent	Yes	Yes	0	0	1

† Yes, toward the end
‡ Yes, at the end.

they do not assure of absolute protection against aspiration.

5. With a proper combination of the methods mentioned in these studies, aspiration hazards may be markedly reduced.

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RESUSCITATION OF THE NEW-BORN*

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THERE is no phase of obstetric practice which is more important and yet gets so little attention as does the resuscitation of the new-born child.

Fortunately most infants cry spontaneously upon being born and the circulatory changes take place without incident, but in many instances there is delay in the establishment of one or both functions and it becomes necessary to use artificial means in the attempt to preserve life.

It is not my purpose to introduce a new means of resuscitation but to recall the importance of the subject, to point out certain errors in the practice and to suggest those methods which have the most merit.

Since the birth of a living and healthy child into the world is the sole purpose of pregnancy and labor, there is necessarily a failure unless this purpose has been accomplished. To those who are called upon to attend the mother through this function, comes the responsibility of sustaining the new life; skillfully, patiently and gently using all means available.

BASIC PRINCIPLES IN TREATMENT OF ASPHYXIA NEONATORUM

There are two important principles in the treatment of the asphyxiated new-born. First, that the respiratory passages are free from blood, mucus and amniotic fluid. Second, that the body temperature be not allowed to fall below normal. In the former instance all that is usually necessary is to suspend the child by the feet, allowing the head to rest upon the table. The mouth and throat are then gently wiped free of mucus by use of two folds of gauze over the little finger, or the throat is massaged upward gently. As a rule these measures are sufficient to clear the lungs. Where there has been deep aspiration of amniotic fluid, it becomes necessary to use gentle artificial respiration during which the child is still suspended. This almost always frees the lungs of fluid. Where these maneuvers have failed to give results it may become advisable to aspirate the mucus by use of a bulb aspirator or the tracheal catheter.

During the time necessary to carry out such manipulations there has been rapid evaporation from the wet skin of the child and a rapid fall in the temperature. To prevent this fall from progressing to a dangerous point, the use of a warm water bath is the most successful.

The water bath has two distinct functions: to maintain body temperature, as already mentioned, and to stimulate respiration and circulation. If the bath is tepid it has no stimulating effect; to obtain that result, it must therefore be warm to the hand. By the addition of hot water, which raises the temperature more rapidly, the stimulat-

* Chairman's address, Obstetrics and Gynecology Section of the California Medical Association at the fifty-ninth annual session, Del Monte, April 28 to May 1, 1930.

ing effect becomes evident: the skin becomes pink, the pulse stronger, and respirations often become strong and regular.

It is not advisable to keep the child in a water bath too long, so warm blankets should always be available, and the child should be well covered as soon as regular respirations have been established, even if there has been no cry.

In instances where success has not been attained by these measures it becomes necessary to further stimulate. Among the older means are the use of cold tubs and spanking. Both of these means while very efficient may become equally dangerous. The cold bath should be iced and if used at all should be only as an instantaneous plunge, the child being immediately returned to the warm water. It is much better to lift the body of the child out of the warm water and to dash a few drops of the cold onto the chest. In several instances that have come to my knowledge I feel sure that the life of the baby has been lost for the sole reason that the shock of immersion into the cold water was sufficient to stop the feeble attempts at respiration.

In spanking, the tips of the fingers only should come in sharp contact with the buttocks. If the full hand is used over the same area the force of the blow may be sufficient to injure the spine, and if the blow is directed over the lumbar or thoracic region very serious damage may result. Many autopsies that show a ruptured liver or kidneys can be traced directly to this cause. Unless one understands this maneuver, one had better not use it; it is very simple and may be efficacious, and yet it is dangerous.

Artificial respiration is necessary to sustain life in the absence of spontaneous respirations. By this method the heart may be kept beating for long periods. The old jack-knife maneuver seems to have stood the test of time better than any other, but this also has its dangers. Chief of these is that too vigorous compression may injure the lungs or abdominal viscera, most often rupture the liver. This procedure must be executed gently but with sufficient force to compress the lungs, and the extension must be sufficient to inflate them but not to the degree of overextension, which causes abnormal tension.

A very excellent means of stimulation is the rubbing of the skin, especially that of the thorax, with a dry towel spread over the loosely extended fingers, the tips only coming in contact with the infant. This may be quite vigorous and still do no harm if the fingers are not stiffened and heavy pressure is not made. Many babies respond to such treatment when other means have failed.

Inflating the lungs by blowing into the infant's mouth must also be very gently carried out because it is very easy, by slightly increased pressure, to rupture the alveoli of the lungs and to produce fatal trauma. In one such case at autopsy the pleura was found elevated into numerous small blisters. The rupture of the alveoli permitted the air to penetrate the lung tissue and separate the pleura.

The use of oxygen, unless perfectly controlled, also carries this same danger, even in the event that a catheter is used. An added danger here is that the catheter may be passed through the mouth or nose, into the esophagus. In two instances this was fatal to infants because, without proper control, the oxygen was turned on with force enough to inflate the stomach and intestinal tract and caused rupture. In one of these cases the pressure was so strong that the gas escaped from the anus.

Perhaps the best method of inflating the lungs is by use of one of a number of instruments by means of which a mixture of 5 per cent carbon dioxid gas with 95 per cent oxygen is passed into the lungs under complete control. It passes through a large, soft rubber bag in which the gas accumulates and is allowed to enter the air passages gently and at intervals, simulating the regular respiratory rate. The most important factor in this method is the presence of the carbon dioxid which acts as a strong respiratory stimulant. I feel certain that this can save more babies than any other method.

The use of Alpha lobelin seems to have definite merit. It is injected intramuscularly and often causes regular respirations to begin. Even though it is not always effective, the drug should certainly be present in every delivery room.

When the problem is one of cardiac failure there are fewer treatments available. The gentle massage of the heart through the chest wall often brings about improvement. As a last resort adrenalin injected into the heart muscle itself may start contractions which have been absent or imperceptible since birth. When it works, it is very dramatic and is life-saving.

The methods and dangers that have been discussed are familiar to all of you, but it is the purpose of this paper to recall them to mind and to call your attention again to the fact that the most important factor of all in the resuscitation of the new-born is gentleness and that next to it comes patience. Many times when we feel discouraged after long effort and are tempted to admit defeat, we begin to get results. How often have you seen one person give up the problem as hopeless and have then seen another take up the work and succeed. My big lesson came one day when I saw an experienced man pronounce a child dead and then saw two nurses resuscitate it.

We have often seen physicians struggle valiently to preserve the spark of life in an old patient who is dying of an incurable disease and we see others give up after a few moments of half-hearted effort when the patient is a new-born child; a young life with untold possibilities ahead of it.

To repeat, it is the purpose of our profession to conserve life; to assist into the world living and healthy children. Where the struggle has been the hardest and where success has been the longest deferred, there we find our greatest reward.

490 Post Street.

EXTRACT OF ADRENAL CORTEX SUBSTANCE*

REPORT OF ITS PREPARATION AND USE—WITH SOME CLINICAL NOTES

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AND
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San Francisco

*DISCUSSION *by Harold Brunn, M. D., San Francisco; J. W. Cox, M. D., New York City; Karl F. Meyer, Ph. D., San Francisco; James Percy, M. D., Los Angeles.*

FOR many years the writers have been carrying on some chemical and biologic studies, with special reference to the action of certain extracts and substances on pathologic disturbances such as angina, high blood pressure, vascular diseases, and malignancies.

The studies on angina pectoris in the year 1927 arrived at a stage where it was possible to publish some results and findings in the form of a book entitled "Angina Pectoris," from the press of Tulane University. A great amount of time, material and investigation were required to gather the material which was used in the chapter on the anatomy of the sympathetic nervous system. The studies on the function of the sympathetic nervous system had a definite relation to our investigations of certain malignancy problems, because of viewpoints which we held concerning the innervation of internal secretory glands by the sympathetic nervous system. For we have held that the endocrine system furnished an active principle, or hormone, which governs or stabilizes tissue growth.

We appreciated from the very beginning that the studies which we had in mind would entail a very large amount of laboratory and scientific investigation, as well as of clinical observation, and that a considerable period of time would be required before any definite findings or worthwhile facts could be brought together which could be of much practical use.

The large number of extensive studies which had been made in these subjects in the past by prominent members of the medical profession made this possibility the more apparent.

For ourselves, we felt that some of the theories having to do with the causes, alleviation and eradication of cancer could not be accepted as fundamentally sound. Nevertheless, an effort was made to study all theories that had been propounded, and all scientific experiments that had been carried out, as well as all results that had been developed as a sequence of the experimentation and scientific research of recent years. Some of the work done by other investigators will be briefly commented upon in this paper.

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* Read at the twenty-eighth annual session of the Pacific Association of Railway Surgeons, August 23, 1930, at Coronado, San Diego, Calif.

* Discussions of Ernest Charles Dalton, M. D., St. Helens, Oregon; F. C. Renfrew, M. D., Long Beach, and William A. Dashiell, M. D., Hollywood, will appear in the reprints of this paper.

INITIAL VIEWPOINTS

In our own investigations we started out with the thought that all malignancies of the human body were constitutional, and that the causes of malignancies would have to be sought for in systemic structures and functions. We held to the viewpoint that the human body is made up of millions of cells, each of which has a characteristic function to perform, and if for any cause any of these cells should be voided of any definite function that it would be only by a definite control that they could be kept within their normal functions and activities. Under such conditions, as we saw it, one of two conditions might arise:

First, cells with no definite function, and without a controlling element, might become what we would then term "anarchistic cells," growing and multiplying at a rapid rate without proper relationships to other tissues and cells of the human body. Such cells could then be looked upon as having somewhat of a parasitic nature.

Second, if cells of the human body, during their functional activity, received an insult by irritation, trauma or otherwise, such cells would also begin to multiply and give expression to themselves in an anarchistic way unless they were held in abeyance by forces as yet not known.

In both cases, it seemed to us, that a controlling element, that is, a sort of governor or stabilizer, would be necessary if a normal condition in the human body was to exist in these particular individuals.

We were of the opinion that nature has provided somewhere in the human body a definite stabilizer of tissue growth in the form of an active principle, or hormone.

With the theory as above outlined in mind we continued our studies, searching hither and thither among the body structures and tissues for this stabilizer of tissue growth. In these many experimental investigations we checked and rechecked on anything and everything that might give us a lead in the right direction. Drugs of all kinds were experimented with, likewise proteins of every type, and serums and extracts of all kinds were made and used. The endocrine system was made a subject of special study, and extracts, by a process which had gradually been developed by us, were made from all portions of the different internal secretory glands. In some instances extracts were made from portions of the glands, and again from combinations of these different extracts, and were used in our work.

EXTRACT OF THE SUPRARENAL CORTEX

In our final experiments we felt we were rewarded in being able to make what we believe may be called a potent extract, and which is made from a portion of the cortical substance of the suprarenal glands. This suprarenal cortex extract, we believe, contains the active principle, or hormone, which is the stabilizer of tissue growth, or to put it in other words, which is a function governor of growth in this human engine of ours.

Through some of our experiments we came to the belief that extracts made from the tissues other than the suprarenal gland gave a slight lytic reaction on tumor growths. This action led us to believe that probably such extracts had an inhibitory effect upon cellular growth where the normal growth for any reason had been disturbed. Nevertheless, these reactions were weak and insignificant, and consequently, for the time being, the experiments with such extracts were put aside for future consideration.

CLINICAL STUDIES AND EXPERIMENTS

As we continued our studies we came to the conclusion that human malignancies would have to be dealt with in a somewhat different way than animal malignancies. We felt that if we were to make any real progress in proving the worth or non-worth of the theories and extracts which had been developed, it would be best done if it would be possible to give the extract, or extracts, which had been elaborated, to human individuals who were suffering from malignant new-growths; and who had been diagnosed as inoperable, and beyond the hope of x-ray, radium or other known and accepted usages. We therefore determined, if possible, to carry on our subsequent investigations as much as possible in the form of clinical studies.

ACTION OF THE EXTRACT OF THE SUPRARENAL CORTEX

When used on human beings with malignant new-growths, we found that the suprarenal cortex extract, when injected in graduated doses subcutaneously at definite intervals, caused marked necrosis in the areas of malignancy, followed in a short period of time by sloughing where such a process was anatomically possible. In patients where such a process was anatomically observable, it was found that the tumor mass usually became necrotic and liquefied. Incidentally, but of importance to many patients, it was also noticed that the pain was often alleviated; or disappeared entirely a short time after the first injection.

On patients who died and upon whom autopsies were done, it was noted that metastatic areas of involvement showed evidences of necrosis, although the areas in some instances were as small as the point of a pencil. Examination under the microscope of such presumably necrotic tissues showed that the malignant tissue had broken down and degenerated and had become necrotic.

From the clinical standpoint of alleviation of symptoms, the patients upon whom these experimental injections had been used stated that they felt better, slept better, and ate better. A striking increase in weight after a short period of injections was also noted in many patients.

PRELIMINARY REPORT OF OUR STUDIES, AS MADE TO SAN FRANCISCO PATHOLOGICAL SOCIETY IN JANUARY, 1930

The preliminary studies and experiments above outlined were quietly carried on for several years up to January 6, 1930, at which time we were persuaded by several of our intimate friends of the medical profession to make a preliminary report concerning our studies and experiments to the San Francisco Pathological Society. At that meeting a short presentation was made of the investigations which had been carried on during the last several years, a few patients to illustrate some clinical phases of our work being shown at the same time. Several anatomical specimens were also presented at that time in illustration of pathological aspects of the work, these being discussed by Dr. A. M. Moody.

The preliminary report on our studies and experiments which was made at that meeting of the San Francisco Pathological Society on January 6 last, caused much discussion among members of the medical profession, and this in turn, because of the interest which the lay public had in recent years taken in cancer as a public health problem, caused a number of newspapers, both in California and elsewhere, to give an unusual and unexpected publicity to the experiments which were there reported. This publicity in lay newspapers and publications was no doubt the cause of hundreds of unfortunate sufferers of this dreaded disease being brought to our doors for help. The result has been that, up to the present time, we have had under our care in the clinics which were established by us in California some two thousand patients, all presumably suffering from some form of malignancy. More than double that number were turned away because they did not bring proper credentials from their personal physicians, making them eligible to be admitted to our clinics. In this connection it is important to emphasize that we have never made any claim for a cure for cancer, but we have stated definitely to all that we were conducting research studies on malignancies of all types, with a suprarenal extract prepared according to our method.

PREMISES FOR OUR STUDIES

It may be well to restate the premises of our studies which were outlined in the March issue of CALIFORNIA AND WESTERN MEDICINE, pages 209-210. These premises are:

1. Nature has provided certain controls, or "governors," in our physiological make-up, among which is a control or stabilizer of tissue growth.

2. This control, or stabilizer of the development and multiplication of tissue cells is of the nature of an active principle, or hormone.

3. This hormone is produced by certain cellular elements of the body which are found to exist in considerable amounts in the cortex of the suprarenal glands.

4. This hormone, or active principle, may be produced in other parts of the body yet to be determined. We have found that extracts made from other tissues have what we think is probably an inhibitory effect on cellular growth where normal cellular growth has been disturbed.

5. This hormone, or active principle, is found in a highly potent form with unmistakable effect

upon malignant cellular growth in extracts made from a portion of the cortex of the suprarenal glands.

6. This extract containing the active principle has a destructive effect upon malignant tissue, causing its necrosis and death, without destruction of normal tissues.

REQUIREMENTS FOR ADMISSION INTO CLINICS

It may be proper at this point to make mention of the fact that at the clinics which were established in the cities of San Francisco, Los Angeles, and Long Beach, no fees were accepted by us for the professional services rendered by us in injecting the extract, or for the extract itself. Each patient was told that our work was in the nature of experimentation and that no promises as to any results could be made. Also, that in the event of death, it was desired that an autopsy should be permitted. In order to avoid every possible criticism the following requirements were laid down for the study of the effect of the extract on patients to be admitted to our clinics:

1. That each patient must have two letters addressed to us from attending physicians in which letters the physician or physicians clearly stated the diagnosis and the fact that the patient's malignant condition was presumably inoperable and beyond the hope of improvement through x-ray, radium, or other methods.

2. That each patient must present a letter from the attending physician in which he stated he referred the patient to us for the administration of the extract.

3. That each patient must present a biopsy report, together with the pathological tissue slide; or x-ray diagnosis or x-ray plates in a patient where biopsy has been found impracticable, such as a malignancy of the stomach.

4. A résumé history of the case history from the physician who had previous charge of the treatment or from the hospital in which the patient had been treated.

5. The written consent of the nearest relative for an autopsy in the case of death.

With the above facts in our possession and with the clear understanding between the patients and ourselves on these matters, the extract injections were given. In a general way the other procedures which have been developed and which it was aimed to carry out are as follows:

Notes and physical examination were made of each patient by the clinic doctor to whom such patient had been assigned. Microscopic photographs were made of the pathologic slides, and these were attached to the history together with the pathologic reports on the tissues, as made by our own pathologist. Colored lantern slides, together with actual photographs, were made before the first injection in every patient where it was anatomically possible. Subsequent lantern slides and photographs were made at stated intervals for comparison. Microscopical examinations were made of pathologic tissues as indications arose.

It may also be stated that patients receiving the suprarenal cortex extract in the clinics were charged neither for the extract nor for professional services rendered in giving the injections. From time to time grateful patients have desired to pay the attending physicians, but in all instances such patients were told that the money could not be accepted, but if they wished they could make their donations to one of the funds which have been established to aid in maintaining the clinics.

PREPARATION OF THE SUPRARENAL CORTEX EXTRACT

Much interest has been manifested by many colleagues concerning the method of preparation of the suprarenal cortex extract. It was our belief that if details were given of our method of preparation at too early a date that many attempts would be made by drug houses, both good and of the irresponsible type, to put out similar extracts or unduly exploit the same. For that and other good reasons it was felt that it would be a wiser plan if a patent were secured from the United States Government to cover the manufacture of the extract. In that way unlicensed and improper manufacture and exploitation could be better handled. Moreover, if with the passing of time the extract was shown to have special merit the income which might be received could go into the funds that would enable the clinics to be properly maintained.

The United States Government recently granted patent rights to cover the preparation of the extract, and there is now no further necessity of secrecy on the methods used in its production. This protection by patents should also permit a change in certain clinic procedure methods in the future.

The following is a summary of the technique of the preparation of the extract. Further details of this technique will be gladly given to physicians.

Extracts have been prepared from the suprarenal of various animals, but it has been found advantageous to use the suprarenal glands of the sheep.

The essential steps in the preparation of the extract that is now used may be briefly outlined as follows:

1. The suprarenal glands should be placed in a normal saline solution at a temperature of 15 degrees Centigrade for a period of three or four minutes prior to dissection.

2. Careful preparation of the glands and dissection of a portion of the cortices from the suprarenals should be made under the magnifying glass, until a sufficient amount of the glands are prepared; the glands being kept at all times in a cool, ventilated container, the temperature of which should be kept between 15 and 50 degrees Centigrade. The dissected portion of the cortices, with their envelopes, are used.

3. Pure distilled water is then added, in a proportion of two and one-half parts of water by volume, to each part by volume of the gland material before masceration of the material. The mixture is allowed to stand for about ten minutes.

4. The mixture is next put in a sterile container and subjected to heat, preferably a water bath.

5. In the water bath the temperature of the mixture is raised to 60 degrees Centigrade, and then gradually increased for about a quarter of an hour to 70 degrees, and kept at this temperature for from sixteen to twenty-four hours.

6. It is then raised to a temperature of 85 degrees Centigrade and kept there for one and one-half hours.

7. The temperature is next decreased to 65 degrees Centigrade and maintained at this temperature for a period of twenty-four hours.

8. At any time during this 65 degree temperature period dilute hydrochloric acid is added in amount necessary to produce a very faintly acid reaction (to litmus).

9. The mixture is now removed from the water bath and allowed to cool at a temperature of 55 degrees Centigrade.

10. The mixture is then strained through three-ply gauze, and the residue pressed until substantially all the liquid has been removed.

11. The liquid is next passed through fine filter paper. To the filtrate, absolute alcohol is added in a quantity sufficient to make two and one-half times, or more, of the volume of the filtrate.

12. The mixture is then allowed to stand for twenty-four hours at a temperature of 15 degrees Centigrade, to permit precipitation.

13. The supernatent liquid is then decanted, siphoned off and filtered through fine white filter paper, the temperature being then dropped to 13 degrees Centigrade.

14. At this temperature the mixture is allowed to stand for thirty-six hours for further precipitation and again the liquid is decanted and filtered through fine white filter paper.

15. The liquid is then allowed to stand for twelve hours at the same temperature.

16. After filtering through fine white filter paper the alcohol is distilled off so as to have an alcohol-free aqueous solution.

17. The solution is then carried through a series of steps of chilling, preferably at 15 degrees, and filtered through fine white filter paper.

18. The resulting filtrate is next passed into a sterile flask through a porcelain ceramic filter.

19. A suitable amount of preservative is next added (tricresol, 0.2 per cent).

20. The liquid is again allowed to chill at a prescribed temperature and stand for cloudiness, and if cloudiness is apparent, it is again filtered and passed through porcelain, or its equivalent filter.

21. After standing thirty-six hours and found to be clear, the sterility of the product is tested and finally it is bottled by the customary procedure. The extract is then ready for use.

HOW INJECTIONS OF EXTRACT WERE GIVEN

Injections were made, when possible, twice a week, although there are some patients to whom only weekly injections were given. The dose was graduated from one minim, which was given as the first dose, increasing this amount to twelve minims, which is given as the maximum dose in the average type of patient. Farther along comment will be made concerning patients to whom larger or smaller maximum doses were given. The question of dosage is still being studied and it is possible that these dosages which have been used in the past may be changed both as to quantity, and as to intervals between doses.

The extract was given subcutaneously and at some distance from the malignant growth or involved area, preferably in the arm, when the arm was not involved in the malignancy. Intravenous injection of the extract was given to those patients in whom we desired more rapid action to take place, the doses in these intravenous injections being graduated from one minim up to the maximum in somewhat slower fashion and with longer intervals between doses.

There were no special local irritations at the sites of injections, and there were in many patients little or no systemic or constitutional reactions. The temperatures of the patients did not rise, nor were there any cardiac or other noticeable unpleasant reactions.

SOME GENERAL COMMENTS ON CLINIC MATERIAL

Some of the observations which have been made in our clinics since they have been established in San Francisco, Los Angeles, and Long Beach may be of sufficient interest to warrant mention here.

In the past six months about twenty-six hundred patients have come under our observation. Many of these patients have improved and returned home. Some have died (13½ per cent). The majority of the patients have continued under treatment in the clinics.

EXTRACT INJECTIONS IN CONJUNCTION WITH X-RAY OR RADIUM—SHEEP EXPERIMENTS

In a goodly number of patients who had been given the extract it was noticed that a longer time than usual was required before any macroscopic changes or results could be seen in the area involved. After careful tabulation of these patients we found that they had either received x-ray or radium within a year prior to coming under the extract treatment. This tardiness of such patients to react to treatment was carefully investigated. It is our belief that x-ray and radium therapy delayed the action and beneficial results which so often are evident from the use of the suprarenal extract.

From this observation the question naturally arose as to whether x-ray and radium destroyed the cortex of the suprarenals to in turn create a great deficiency of the hormone, or active principle, derived from the cortex of the suprarenal gland in such an individual. If such action did occur it would naturally account for the observations just noted.

In searching the literature we found that other investigators had already arrived at somewhat similar conclusions. For instance, Golubinin,[1] Harvey,[2] Strauss,[3] and Holfelder and Peiper.[4] These men reported changes of degenerative nature that were restricted entirely to the cortex after application of deep x-ray over the adrenal glands.

Groedel,[5] Stephen,[6] Weinstein,[7] and Levy and Dorn [7] reported that irradiation of the adrenals increased blood pressure. Their observations substantiated our viewpoints that if the cortex was destroyed and there was a deficiency of its active principle, or hormone, as contained in our extract, and which seemingly lowers blood pressure, there would naturally be a reaction in such a patient, and consequently a rise of blood pressure.

David [8] and Hirsch [9] reported that large doses of x-ray suppressed glandular activity, although small doses at first stimulated activity.

At the present time we are carrying on experimental work on this particular phase of the work

and are using some one hundred and fifty sheep in these experiments, having given these sheep different doses of deep x-ray therapy. We hope in the near future to be able to have some definite information of a microscopic and pathologic nature as to the changes which take place in the cortex of the adrenals following radiation exposures.

The important question which recurs to us again and again is this: Do x-ray and radium, following their use after operations on malignancies, hasten or cause metastases to take place more rapidly, and does their use hasten or cause earlier deaths?

Some very interesting observations in this connection have been given by Doctor Kanavel to Dr. James Percy, the latter quoting Kanavel as follows: "He stated that if a patient, following amputation with a cold steel knife, had a cancer recurrence, such recurrence would take place within a year to fifteen months if pre- or post-operative radiation had been used; and if these had not been used that recurrence would come within two and one-half to three and one-half years." Such a conclusion, if correct, would tempt one to believe that x-ray or radium therapy was not conducive to the ultimate eradication of cancer.

CARBOHYDRATE METABOLISM IN CANCER PATIENTS

Observations on our patients as far as we have gone have caused us to believe that where a blood-sugar level was high the patient reacted less favorably to the extract, and that sloughs would be much slower in formation unless the patients were put on a low carbohydrate diet. This observation is seemingly substantiated by Jackson [10] in his recent paper on carbohydrate metabolism and cancer.

At the present time we are endeavoring to have sugar tolerance and blood sugar tests done on as many of our patients as possible in order to arrive at a more definite analysis as to carbohydrate metabolism in cancer patients.

PAIN IN MALIGNANT NEW-GROWTHS

One of the most outstanding observations concerned alleviation of pain in a great majority of the patients, which alleviation was noted early in the work, as indicated by table given below.

Our observations lead us to affirm that our extract has a vasodilator action, which is in direct contrast to the action of adrenalin, which has a vaso-constrictor action.

We know from our studies on angina pectoris, and from the theories and work of others on that dreaded malady, that the pain in angina pectoris is due to constriction of the coronary arteries. We also know that any artery, when it contracts, causes such a characteristic pain. We know that arterial constriction is brought about by contraction of the muscular coat, which contraction in turn comes from innervation through sympathetic nerve fibers. We have proved in our previous studies that sympathetic nerves are both afferent and efferent, or, in other words, have shown that a sympathetic nerve is capable of conducting sensations of pain. (Coffey-Brown-Humber: Angina Pectoris, 1927.)[11]

Coming back again to the consideration of cancerous new-growths, we believe that most of the pain experienced by patients suffering from malignancies is a type of sympathetic nerve pain, which in turn is due to vascular constriction. Our belief that the suprarenal cortex extract is a vasodilator leads us to believe also that it is capable of relieving such pain.

In a smaller number of patients who suffer from malignant new-growths, pains have been noted which are due to sensory nerve involvement, either through direct irritation or from pressure causes. Such pain the suprarenal cortex extract does not relieve directly to any degree. The only relief which was obtained in sensory nerve involvement through injections of the extract seemingly came about through necrosis, liquefaction and sloughing, or through disappearance of swelling and induration. If any of these changes resulted, direct pressure on the involved sensory nerve could be lessened and the pain probably would be relieved. An exposed sensory nerve is, of course, capable of causing most intense pain, and the use of the extract will not directly relieve such sensory nerve pain. Fortunately in most patients who are suffering from malignant new-growths, the pain more often is of a sympathetic nerve pain type. The use of the suprarenal cortex extract did relieve the majority of such patients.

IS IMPROVEMENT DEPENDENT ON PSYCHIC CAUSES?

It has been suggested by a goodly number of colleagues that the relief of pain in many of the patients who have received treatment in our clinics is probably dependent upon psychic causes or reactions.

We ourselves do not hold such an opinion, for we have on many occasions used checks or controls in our effort to learn whether the psychic element was the important factor in the relief of pain which was observed.

To illustrate: We selected from twelve to twenty-four new patients who were suffering with intense pain, these patients not being in one particular group who received treatment at a particular time, but being known only to the observer who was giving the extract. In each such patient the needle of the hypodermic syringe was injected into the arm, as if for an injection, but no extract was given. As the first dose in regular routine was only one minim, such a patient was unable to tell that the extract had not been given, and especially so since there is practically no local irritation in any form in these beginning doses. In every instance, when the extract was not given, the patient was not relieved to any degree of the pain, whereas in other patients, running into tens and hundreds, the pain was relieved after the first dose. Upon the second visit to the clinic the extract was actually given

to these control patients, and in practically every instance the pain was subsequently relieved.

A disagreeable and very objectionable feature in the early stages of our clinical work was the offensive odor in the clinic rooms, especially when so many patients were gathered in one large room. You know heretofore many of these unfortunate malignancy patients who had such offensive odor were refused hospitalization. Today practically none need be refused because of that reason. The use of the suprarenal cortex extract changes the picture. In other words, the odor practically disappears.

QUESTIONNAIRE ANSWERS FROM 672 PATIENTS

The percentages here given were obtained from questionnaires which were answered and signed by 672 representative patients who, suffering from malignant new-growths, and having been positively diagnosed as such, received injections with the suprarenal cortex extract in our clinics. Table 1 presents a summary in the form of percentages which have a bearing on the comments just made.

TABLE 1.—*Questionnaire Percentage Results as to Pain—Includes Six Hundred and Seventy-Two Patients*

	Per cent
Pain greatly or entirely relieved	71.5
Never had any pain	10.31
Pain not relieved	12.8
Doubtful regarding relief of pain	5

Another interesting observation is that a great majority of the patients, after having received several injections of the extract, aside from the local reaction on the malignant new-growths, improved both physically and mentally.

The general condition of such patients appeared to be considerably improved, in that their bowels moved better, appetite and sleep improved and they felt better generally.

The percentages dealing with these symptoms and functions, based on the answers received from the 672 patients already referred to, are as given in Table 2.

TABLE 2.—*General Well-Being Results—Includes Six Hundred and Seventy-Two Patients*

	Per cent
General improvement (disregarding pain)	88.9
No improvement	6.9
Doubtful as to improvement	4 +

OBSERVATIONS OF M. G. MACNEVIN

Dr. Malcolm Graeme MacNevin, formerly assistant professor of medicine and chief of clinics, New York Postgraduate Medical School and Hospital, New York, who became associated with us five months ago, has been actively engaged with us in our work in the clinics during that time and gives the following interesting observations based on his experience during this period:

"The cancer patients seen at the Coffey-Humber Clinic at the Southern Pacific General Hospital in San Francisco present the two usual great complicating problems of malnutrition and anemia. Malnutrition and underweight are present in 75 per cent and the hemoglobin ranges between 40 per cent and 65 per cent in the majority of the patients, with percentages some above and a few below these figures. Over 50 per cent of the patients need blood transfusion, which may have to be repeated several times.

"The patients with milder grades of anemia are given the usual remedies hypodermically or by mouth, preferably by the former method, and these measures are pushed vigorously after transfusion as a routine procedure, in order to sustain the hemoglobin and to lay the foundation for a gain in weight.

"Usually it is a rather uphill problem to improve the nutrition of the cancer patient. However, it has been noted at this clinic that the extract has a stimulating effect on the appetite and bodily vigor in many patients, probably by supplying an endocrine deficiency. Added to this there is a cessation of pain after the first injection of the extract in more than half of the patients who had pain at the time of the first injection; and as a consequence, freedom from the baneful effects of morphine and codeine, which many had been using, all of which pave the way for an intensive feeding program much more likely to succeed in an effort to elevate the individual to a higher physical plane."

OBSERVATIONS OF A. W. WARD

Dr. A. W. Ward, our oral surgeon, has made a very careful study of cases in the clinics in both San Francisco and Los Angeles. He has complete data on 390 cases. Some of his tabulations are as follows:

TABLE 3.—*Showing Per Cent of Focal Infections in a Group of Female Patients Who Had Malignant New-Growths*

A.—By Age Periods (160 Female Patients)

Ages	No. of Patients
20 - 30	4
30 - 40	15
40 - 50	44
50 - 60	56
60 - 70	28
70 - 80	13
Total number of female patients reported	160

B.—Focal Infections (160 Female Patients)

139 or 87 per cent had undergone no tonsil operations.
12 or 7 per cent had had their tonsils removed.
14 or 8 per cent had arthritis.
137 or 86 per cent had no arthritis.
72 or 45 per cent have or had dead teeth.
82 or 51 per cent have or had pyorrhea.
43 or 27 per cent had had all teeth extracted.
7 or 4 per cent still had good teeth.

C.—By Age Periods (235 Male Patients)

Ages	No. of Patients
20 - 30	5
30 - 40	18
40 - 50	41
50 - 60	56
60 - 70	83
70 - 80	27
80 - 85	5
Total number of male patients reported on	235

D.—Focal Infections (235 Male Patients)

233 or 95 per cent had undergone no tonsil operations.
12 or 5 per cent had had tonsils removed.
19 or 8 per cent had arthritis.
214 or 91 per cent had no arthritis.
84 or 36 per cent have or had dead teeth.
156 or 66 per cent have or had pyorrhea.
56 or 24 per cent had all teeth extracted.
10 or 4 per cent still had good teeth.

We believe this line of investigation opens up interesting possibilities. It would be easy to believe that focal infection can be a contributing cause of degeneration of the suprarenal glands, for it has been thoroughly demonstrated that the functions of the liver, pancreas and endocrine glands are altered by focal infection.

HOW IMPROVEMENT IN THE GENERAL CONDITION AIDS

The element of hopefulness which comes into being after injections with the extract seems quite important to us. With improved mental outlook, the patient's mind becomes occupied along constructive lines and an attitude of genuine whole-hearted coöperation is frequently observed. In such patients, with proper diet, an increase in weight to the extent of ten or twenty pounds or more has often been noted. With such improved state of nutrition the hemoglobin rises, and under such improvement a better response to the extract, as evidenced by softening and sloughing of the cancer mass, especially after ten to fifteen injections of the suprarenal cortex extract, has often been observed.

These expressions of improvement seem to us to be important, because we are of the belief that with such improvement in general condition, brought about presumably by the extract, there results increased action by the extract. In other words, a beneficial circle, the reverse of a vicious circle, is seemingly established. Some case reports which emphasize these viewpoints are given in later portions of this paper.

It has been previously stated that patients who sought admission to the clinics for injection with the extract were obliged to submit letters from former attending physicians, in which each such attending physician expressed his opinion that his patient was suffering from a malignant growth that was so advanced as to preclude hope of successful results from the use of radium or x-ray or from surgery—in short, was presumably inoperable.

Now it has been our experience that a certain proportion of such patients, after receiving the extract injections, become so improved that surgery may not be contra-indicated. For example, among other types which have been observed may be mentioned frozen breasts, immovable and solid against the chest walls, with glandular involvement in the axilla and supraclavicular region, changing in character after extract injections, to the extent that the enlarged axillary and supraclavicular glands subside, the induration and hard nodular involvement and carcinomatous mass clearing up, the breast dropping down and becoming pendulous, the malignant area in many instances softening and even sloughing and the angry purplish color changing to more of a normal color. In several instances nodules of varying sizes grew smaller, became flattened and disappeared. Such a type of breast may be said to have changed from an inoperable to an operable breast. Such breasts have been removed, and, after a normal length of time following the surgical intervention, the wound has healed, with no indication of a malignant mass.

In patients in whom the breasts were allowed to continue to slough without surgical interference, the absorption process and convalescence took place more slowly.

ACTIVE PRINCIPLE OF SUPRARENAL CORTEX SECRETION AND DOSAGE OF EXTRACT

We have given much effort in trying to determine what is the best and proper dosage for the suprarenal cortex extract which we have elaborated. We confess that we feel that much is still to be learned on this subject. At the present time we believe that in an adult the cortices of the suprarenal glands secrete each week enough of the active principle, or hormone, to be the equivalent of at least twenty-four minims, and probably more, of the extract which we have elaborated. We have noted patients in whom more than twelve minims twice weekly were necessary to obtain any results whatever. No doubt in these patients the cortices are to a large degree probably functionless.

SUPRARENAL CORTEX ATROPHY IN RELATION TO CANCER FREQUENCY OR AGE

It is well known that the thymus gland normally atrophies before the age of fourteen. And we know that there are changes taking place in the other endocrine glands throughout life. We have found changes in the cortex of the suprarenal glands in individuals past the age of forty, and particularly in those individuals who have died from some type of malignancy.

The interesting question arises, therefore, as to whether the cancer age is that period of our life in which our cortices are most likely to become atrophied or deficient in their function.

ACTION OF EXTRACT IN VARIOUS TYPES OF NEW-GROWTH MALIGNANCIES

Among patients who have been treated are examples of sarcoma of bones, and in the x-ray pictures of these a change has been noted. In these instances calcification seems to have taken place, the bony structure changing from a honeycomb type to a practically normal appearance. In other instances of sarcoma of the bone, with spontaneous fracture, similar changes have been noted, followed by firm union.

Several patients with malignant new-growths on the external tissues will be shown you, either in person or on lantern slides. We have observed such external cancers to slough, granulate, and then go on to healing as in regular course. Several patients had face and lip cancers.

A brief outline of several case histories may be read at this point. The complete history records are on the speaker's table, for those in the audience who may wish to consult them.

* * *

One striking result was in a patient who had a carcinoma of the lung, with pleural effusion. This cleared up entirely, and the patient, who, when the first dose of extract was administered, was on her back in bed, troubled with coughing spells and in a

very weakened condition, is now up and around, performing the normal duties of a housewife, and in excellent condition. The x-ray lung pictures of this patient now show a good functioning lung on the previously involved side.

* * *

Mention may be made here of one patient suffering from an endothelioma, with over one hundred lesions on his body and concerning whom three positive biopsies of malignancy were made. The lesions in that patient entirely cleared, all lesions disappearing; the only evidence which is still present of his previous malignant condition being the pink areas where the biopsies were taken, and even these areas are nothing more than scars with practically no induration around them. This patient is here this morning.

* * *

Another patient had a carcinoma of the larynx, with involvement of the pharyngeal tissues. This patient came to us, unable to speak, unable to eat with comfort, and with a history of much loss in weight. This patient had been told that he had only a short time to live. Today that patient is talking as well as any of us, is eating normally, has regained his normal weight, is working every day, and there is no evidence of malignancy on examination. This patient has been brought to this San Diego meeting and will be presented to you for your personal observation.

* * *

One patient, a boy, seventeen years of age, with an x-ray diagnosis of carcinoma of the antrum, was in such a critical condition that he seemed in the last stages of his trouble. The tissues in this boy responded to extract injections, he has gained twenty-seven pounds, is again back at his job and is performing his normal work every day.

* * *

Another patient had a malignant growth in the stomach which, under the fluoroscope, showed a mass which could also be palpated. This patient was unable to eat, vomited frequently, and had lost much in weight. Under extract injections this patient made a steady improvement and on last examination had gained twenty-six pounds. This patient was eating normally, had no vomiting, and was feeling good. The mass in the stomach could not be demonstrated with the fluoroscope on recent x-ray examination.

* * *

A man (H. F. H.) was admitted to the clinic February 29, 1930, with diagnosis of carcinoma of the bladder (by biopsy); had had two-thirds of his bladder resected on October 8, 1929. He was suffering intense pain and was scarcely able to walk at the time he received his first injection. At that time he weighed 140 pounds. At the present time he weighs 162 pounds, has only occasional pain and feels very well. He had had no previous x-ray or radium treatments.

* * *

A woman was admitted to the clinic in March 1930, with diagnosis of carcinoma of the vagina (by biopsy). At that time her weight was 124 pounds. At the time she was admitted to the clinic she was carried in, and was suffering intense pain. After the second injection of the extract the pain was reduced to a soreness and since the third injection she has had no pain and no soreness. Patient had taken no food since the third week prior to her first injection of the extract. After the second injection of the extract her appetite returned and soon became so vigorous that she wanted seven feedings a day. She began to gain weight very rapidly. At the end of six weeks she had gained twenty pounds, and it was largely during this period that most of the sloughing took place. Since this time there has been no recurrence of pain. There has been no vaginal discharge during the past two months. Patient's weight is 164 pounds at the date of this report.

* * *

A man (J. W. C.) was admitted to the clinic on March 21, 1930, with a diagnosis of carcinoma of the pylorus, the diagnosis being made by x-ray. No previous x-ray or radium treatment had been given, nor had the man been operated upon. Patient had been suffering for over a year with pain, nausea, and vomiting, and had lost about forty pounds in weight. His weight on entering the clinic was 154 pounds. After a few injections, pain and vomiting ceased. At present he weighs 165 pounds, a gain of eleven pounds. Patient states that he is eating better, enjoys his food and feels better in every way.

* * *

A man (J. M.) was admitted to the clinic February, 12, 1930, with a diagnosis of carcinoma of the stomach, made both by x-ray and at operation. A posterior gastro-enterostomy was done. This patient, on being admitted to the clinic, was very pale and weak and weighed only 118 pounds. He was having much pain at that time. After a few injections the pain disappeared, vomiting ceased and his appetite returned. The patient from that time on has taken his food with comfort and relish, and at the present time his weight is 161 pounds, a gain of forty-three pounds. He has the general appearance of a normal individual at the present time.

* * *

A woman (Mrs. N. L. S.) was admitted to the clinic on February 14, 1930, with carcinoma of the bladder (diagnosed by biopsy). She had previously had a growth removed from the bladder. She had given up her business in 1928 and had been in bed almost constantly from that time until she came to San Francisco to receive the injections of the extract in our clinic. She has had a slight gain in weight. When she began the injections she could not walk more than six blocks in a week; now she walks four miles a day. After several injections she began to pass large pieces of slough from the bladder. When she began injections she was compelled to urinate every five or ten minutes, the urinations being intensely painful. At the present time she urinates only every three or four hours, and with no associated pain. Patient noted improvement in her condition almost immediately upon starting the injections of the extract, and at present experiences a very decided feeling of well-being.

Many case reports of similar nature to those which are here most briefly outlined might be submitted did time permit.

Permit us to state at this point that from the beginning, members of the medical profession have been welcomed at the clinics which are under our supervision, and this invitation is again extended to any and all who are interested in the studies which we are carrying on.

AUTOPSIES

We have endeavored to obtain an autopsy on each patient who has died. The following is a digest of a report of Dr. A. M. Moody of San Francisco, pathologist and autopsy surgeon for the clinics:

This is a study covering the period from December 2, 1929 to June 1, 1930.

Since all material has been examined from the standpoint of the amount and type of necroses present, an attempt has been made to use a uniform method of grading such changes. This grading was made on the gross material at the time of the autopsy and the terms or legends to be used were designated

as 0, plus (+), two plus (++), three plus (+++) or four plus (++++), to denote different amounts of necrosis and softening.

The term "four plus" (++++), softening, is used only when all tumor masses are extensively necrotic or liquid.

The term "three plus" (+++), softening, means that there is rather extensive necrosis in most of the tumor masses with a principal mass largely liquid or mushy.

The type of softening and necroses which are present frequently in tumors rarely extend beyond what is herein designated as two plus (++). Although the changes may be similar in type, there are marked differences in degree and extent of the process which is seen in either the three or four plus instances.

The following is a summary of the degrees of softening in the two groups of patients for whom the following notations were charted:*

Summary of Group 1—On Twenty-Three Patients Who Received Eight or More Injections

14 had 3 plus to 4 plus softening
3 had 2 plus softening
5 had 1 plus softening
1 had 0 softening

Summary of Group 2—On Sixteen Patients Who Received Less Than Eight Injections

None had 3 plus to 4 plus softening
5 had 2 plus softening
2 had 1 plus softening
9 had 0 softening

From studies along the lines indicated by the above notations by Dr. Moody we believe that in patients having malignancies of the pancreas little or no softening takes place, except where the extract is given over a long period of time. Malignancy of the liver is one of the types of involvement which is very slow in softening.

This study by Dr. Moody on patients in the San Francisco Clinic covers a period from December 2, 1929 (one month before our preliminary report to the San Francisco Pathological Society) to June 1, 1930.

EXTRACT EXPERIMENTATION ON RATS

The question of the desirability of animal experimentation has arisen with us many times. In a limited series of tests of the extract on white rats, definite sloughing was noted in the experimently produced tumor masses. Needless to say these experiments are being continued and a progress report will be subsequently given thereon.

It is well to remember in this connection that various substances have been capable of producing in malignant new-growths, a central necrosis. Experimentation on rodents requires considerably more time than we have been able to give thus far.

Again it should be remembered that malignant tumors experimentally produced in rats spontaneously regress. This latter phenomenon may well be harmonized with our theory, since it is not unlikely that an excessive amount of the suprarenal cortical hormone may influence the malignant growth and consequently bring about spontaneous regression in the tumor tissue.

* Detailed data concerning degrees of softening and other factors, as observed in individual patients by Doctor Moody will be given in a table which will appear in the reprints of this article.

THE INNERVATION OF THE ADRENAL GLANDS

At the beginning of our work we realized that very little was known about the functions of the adrenal glands.

Dr. Alfred Kuntz, [12] professor of anatomy at the University of St. Louis, in his recent book, entitled, "Autonomic Nervous System," has the following statement: "Although the cortical portion of the adrenal glands seems to be essential to life (Crowe and Wislocki, 1914),[13] little is known regarding its specific function."

The innervation of adrenals has been a problem which from the very beginning has been of great interest to us.

COMMENT ON ADRENAL STUDIES BY OTHER INVESTIGATORS

A very interesting article on the subject appeared in the proceedings of the staff meeting of the Mayo Clinic for May 14, 1930, in a paper entitled "The Function of the Suprarenal Gland."

Dr. A. Szent Györgyi [14] made some very interesting statements growing out of his work for many years on the process of oxidation, in the hope of finding the clue to the function of the cortical part of the suprarenal gland. He stated that the chemical study of the suprarenal cortex showed that this organ also contains a highly active and strongly reducing substance, and that this substance is strictly characteristic for the cortical tissue of the gland.

Max A. Goldzieher,[15] in his work on "The Adrenals," published in 1929, gives a very interesting review of the work done up to that date.

Boris Sokoloff [16] has reported the softening of tumor by "corferoll" (a combination of cortical extract and iron). His work was done on rats. His extract was a mixture with iron and pyroll. His injections were made directly into the tumor mass, and not foreign to the growth. He stated in one of his recent articles that he had not made any injections into human beings and did not intend to do so. It would naturally be concluded that results obtained by direct injection into the tumor mass could be accounted for by factors such as local reaction and thrombosis.

Frank A. Hartmann [17] carried on some very interesting experiments in 1926, in which he showed adrenalectized animals could be kept alive by administration of adrenal preparations. His work seemed to show that certain portions of the adrenal gland are absolutely necessary to life.

We in no way disagree with this viewpoint and feel that at least a hormone, which is produced by a certain portion of the adrenals, is necessary for the stabilization of tissue growth, if such stabilization is necessary at any time in human life, for the prevention of malignant growths.

Dr. A. M. Hanson [18] reported four cases of inoperable carcinoma treated with intramuscular injections of extract made from the thymus glands.

As stated previously in this paper, extracts made by us from other glands than the supra-

renals gave faint reactions, but we felt the results were negligible.

Numerous other investigators have carried on work of the type here outlined. Many recent reports, to our minds, have only corroborated and confirmed our viewpoints and observations.

At the present time we only claim that we have a potent extract made from the cortical substance of the suprarenal glands. By the word *potent* we mean that the extract must relieve pain, and must cause more or less softening, liquefaction, necrosis and sloughing of malignant tissue. The extract which has been prepared by us is non-irritating when injected subcutaneously into human tissue, and is non-toxic when injected in prescribed doses intravenously. We may add that we have injected as high as 2 c.c. into the veins of a rabbit without noting any ill effects.

GESCHICKTER'S CRITERIA FOR CANCER CURES

Our clinical studies on the action of the suprarenal cortex extract has led many persons, including a considerable number of physicians, to think that we were offering, or claiming, to have discovered a specific treatment, or cure, for malignant new-growths. At no time have we claimed a cure, or even a treatment for cancer. We have only claimed that our extract from the cortical substance of the suprarenal relieves pain in a great majority of the patients and causes liquefaction, necrosis and sloughing phenomena.

Geschickter,[19] in his article in 1929, laid down certain criteria for judging cancer cures. We ourselves have offered no cure, and do not feel that it is necessary to wait five years (which is the period laid down by Geschickter to prove a cure) before we at least give a progress report on our studies with the suprarenal cortex extract, and its action as noted in clinical experiments. We make biopsies or x-ray diagnosis on all patients, however, and this is in line with the provisions of Geschickter's criteria. We have given the extract injections to patients with all types of malignant new-growths, as they have presented themselves. We have observed patients who have had metastases, in whom the metastases seemingly disappeared.

HOW OUR CLINICS AND OTHER STUDIES WILL BE CARRIED ON IN THE FUTURE—THE BETTER HEALTH FOUNDATION

Under the auspices of the Better Health Foundation of California we intend to carry on a constructive five-year program of scientific research along lines such as have been indicated in this report.

The Better Health Foundation of California is a non-profit corporation, and was organized some time ago to carry on work for the extension of scientific research and other worthy purposes.

The officers of the Better Health Foundation of California recognize the fact, which we all so fully appreciate, that up to now the cancer problem has not been solved; also, that it is unscientific and unwarranted for any individual, or any association of individuals, to attempt to become infallible authorities on a subject concerning which so many vital facts are still unknown. As Californians and Pacific Slope physicians, you may be interested in knowing that the Better Health Foundation has on its board of directors such well-known medical men as the following: Reginald Knight Smith, president; John Gallwey, James W. Ward, Langley Porter, Charles D. McGettigan, Harold Brunn, O. D. Hamlin, William Palmer Lucas, Dudley Smith, Ferdinand Stabel, Hartley F. Peart, attorney for the State Medical Society, and Celestine J. Sullivan, LL.D., editor of the *Better Health* magazine.

We ourselves believe that the medical profession and the public may confidently rely upon the broad vision and sound judgment of these experienced and high-minded men who compose the board of directors of the Better Health Foundation to coöperate with us in the scientific and fact-finding studies on this suprarenal cortex extract with which we have been carrying on our studies, and on other procedures as well, and that they will follow truth in any direction in which progress may be expected.

To obtain the best results it has been decided that the future distribution of our extract for research work to coöperating doctors, clinics or hospitals will be made available through the Better Health Foundation, because in that way improper claims or commercial exploitation of the extract may be better prevented.

A presentation of lantern slides and of patients who have been kind enough to come to this meeting will now be made. Those of you who wish to examine the case histories and the patients are at liberty to do so.

Southern Pacific General Hospital, San Francisco.

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DISCUSSION

HAROLD BRUNN, M. D. (384 Post Street, San Francisco).—As I said to Doctor Coffey soon after he read his paper at the Pathological Society on January 6, 1930, "It's hell if you have it, and it's hell if you haven't it."

Doctors Coffey and Humber have enunciated an hypothesis as yet unproven. They have enunciated a mode of treatment with results such as you have heard. They have described pathologic changes as a result of these injections. Are these findings convincing enough to demand verification? Shall the searchlight be thrown upon them or shall we cast these observations aside and say, "They are worthless." What shall our attitude be? Shall we be negative? Shall we be actively antagonistic or shall we assume an attitude of helpfulness?

Each one of us must decide that question for himself. As for myself, I have decided that I will give my sympathetic coöperation and will feel satisfied if only a grain of truth may be found; for I would regret exceedingly to thwart in any way an effort so honestly and sincerely made. On the other hand, our critical scientific judgment must not be carried away by overenthusiasm. In such a vital subject as this the basis of every statement must be carefully weighed and considered.

Eight months have now passed since Doctors Coffey and Humber's first announcement. Several thousand patients have received the injections. It seems to me that the time has now arrived when definite steps should be taken, with the assistance of the best minds that can be obtained, to evaluate what has already been done—and to organize a plan for future study.

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J. W. COX, M. D. (Field Director, American Society for Control of Cancer, New York City).—I do not know why I have been called on to speak in this discussion. I have talked the entire situation over with Doctors Coffey and Humber and expressed my opinion of what I have come in contact with since I have been here. You have heard everything I have heard in your own community, for I believe most of you are physicians from California and the Pacific Coast.

I want you to keep this in mind, that the average doctor sees about three cancer patients a year and most of those patients are of the incurable type. He wants to get rid of them. I am saying this for a reason, and I believe this is true. Most of the patients who come to a doctor in the beginning are given surgery, x-ray, and radium, and how few of them, one per cent of the early cases, get good results; while in the later stages 20 to 30 per cent are given no aid.

I have been visiting institutions in various parts of the country. It is not necessary for me to tell you of what is happening regarding incurables. Consider what happens to them in your own particular community. Often in our institutions they are most pathetic patients experiencing considerable pain, and they die, grasping for straws. They are asking for and seeking relief. Not one institution was giving special treatment. That patient who was not relieved by surgery, x-ray, or radium was permitted to die at home, to be made as comfortable as possible, with a considerable degree of hopelessness and did not go to bed until within a couple of weeks of his or her death. We fail to sufficiently consider the incurable patient. Since I have been in San Francisco and Los Angeles I have been impressed with the careful consideration that has been given to the usually considered hopeless patients. I find that the patient who has received the extract has a better feeling of well-being and of better nourishment. I have talked with many who state they have been relieved of pain. I had never seen the smiles on the faces of cancer patients such as I have seen here. The word "cure" has never been used to my knowledge since I have been in San Francisco and Los Angeles.

Now about this practical question of the Coffey-Humber progress. These doctors are working on the physiology of the adrenal cortex, which is being done through an enormous number of experiments. When they get through, we will know something about the cortex of the adrenals. I do not believe this is a specific that kills cancer cells. I think Doctors Coffey and Humber agree with me. On the other hand, I believe there is something to it. If nothing else comes of it, isn't it worth while? Hasn't it been handled on an ethical plane and in a scientific manner? It is unusual, perhaps, but many good things are unusual. It may be an insufficient mass of data has been secured up to the present time to warrant conclusions, but the material that has been gathered in this work warrants further effort in detail, chemically, pathologically, and clinically.

I will say that I have seen groups of patients who were taking the extract who, as a group, were doing fine. Again, I have seen other groups who were not doing so well. We are all much interested, and we will have to admit there is something to the adrenal cortex that we do not know about; and if Doctors Coffey and Humber will continue and carry on we will be grateful to them.

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K. F. MEYER, Ph.D. (Hooper Foundation for Medical Research, University of California).—It doubtless appears presumptuous to discuss the paper of Doctors Coffey and Humber which deals with a field of endeavor largely foreign to the reviewer. In fact, it is hazardous for anybody to discuss this subject in which we are just beginning to realize the importance of detailed data and from which an endless number of questions and problems can be formulated but no definite conclusions drawn. As in nearly all developments of medicine, the new problems seem at first simple. A leading thought or hypothesis becomes the stimulus to the undertaking. With the accumulation of facts the original concepts may become obscured and the problems grow more complex. This is particularly true when one enters a field so new as that which deals with the relationship of the endocrines to tumor growth. Doctors Coffey and Humber have developed some interesting ideas and observations which certainly deserve further investigation. The experimentalist would naturally approach the many problems which immediately suggest themselves by way of the laboratory. In the progress report by Doctors Coffey and Humber it is shown that the direct clinical tests may give encouraging findings. However, since they are working with at least two unknowns, first, the chemical and the pharmacological properties of the extract prepared according to their formula; and second, the cause or causes of the tumors, it is unquestionably imperative to combine laboratory and clinical studies. Methods to test the potency of the extract, its uniformity in active substances and its effect on cellular growth in tissue cultures are needed. There are many similar phases which must be investigated. The execution of the program may require years of painstaking labor. It is a great satisfaction to know that "The Better Health Foundation" sponsors such a program and is promised funds adequate to carry it out.

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JAMES PERCY, M. D. (1030 South Alvarado, Los Angeles).—There is one phase of this treatment that has not been emphasized or discussed at this meeting. The vast majority of the people who are taking the Coffey-Humber suprarenal cortex extract injections can be classified as terminal cases, and when

you see any of these patients under treatment improve, it is foolish at the present time to try and classify them along usual scientific lines. Dr. James Ewing said to me when I saw him in New York City last June, "There are many things in medicine that scientifically we decide cannot be, and yet clinically they may finally prove to be true."

In what I shall say I do not want to be misunderstood, because many of these people who apply for this treatment are not cured; even though a large percentage of them are benefited amazingly both physically and mentally even when, I repeat, they are not cured. To illustrate: I saw two men in the Coffey-Humber clinic at Los Angeles who had about the same degree of gross mass of cancer in the corner of their mouths. The disease involved both the skin and the mucous membrane inside the cheeks. Under the microscope the tissue removed at biopsies gave exactly the same picture, and yet under exactly the same treatment one of them went on to a splendid recovery, while the other did not seem to be improved in any measure, so far as the local condition was concerned.

If any of these patients has previously had an application of radioactive methods followed by the usual fibrosis, it takes twice the amount of the extract to give the same result as occurs in those who have not previously been treated by radioactive methods. Another practical observation is that where the malignancy is fixed as in the breast, after the application and administration of the extract, a sort of hemolysis seems to take place between the dead and the living tissues, making the breast, or other fixed malignancies, movable, and therefore much more favorable for surgery. When one of these cases is subjected to operation, even by cautery, it is quite remarkable how freely they bleed, even though the cautery is used to prevent the bleeding. In other words, it takes twice as much heat to stop the bleeding in patients who have been given the extract injections as it does in patients in whom the cortex extract has not been used.

From my own general observation I believe that easily 80 per cent of these patients are relieved of pain following administration of the extract. Every once in a while I meet a physician who has had one patient receiving these injections concerning whom he reports there was no improvement either locally, or in the patient generally. In one patient this can easily be true, but let me beg of you not to draw conclusions from an experience of just one patient in any method of treatment in any disease. When I was in Germany many years ago I attended one clinic where they insisted that one should not decide for or against the value of any method of treatment without first having had an experience with at least one thousand patients in that particular method.

I have heard it stated that the Coffey-Humber extract benefits were due to spontaneous recessions of the growths. This may be true, but if it is, there are a larger number of spontaneous recessions resulting from these injections than has ever been experienced before in the treatment of malignancies, and if this extract can initiate spontaneous recession it is a new phase of the subject that has never before had an explanation.

Dr. James Ewing of New York told me a few years ago that "the cancer process was very insecurely balanced." That was one of the most wonderful statements relative to cancer clinically that has ever been made.

With your permission I shall present at this time two patients from among many I have observed. One of these is the man who is before you. About two and a half years ago he was operated upon in the Los Angeles General Hospital for carcinoma of the stomach. When the abdomen was explored, it was found to be an inoperable carcinoma of the pylorus which had extensively invaded the liver. The record shows that the surgeon decided he was utterly inoperable and the abdomen was closed. The man was finally discharged from the hospital and was not seen again for about one and a half years, when he appeared before the malignancy board of the same hospital. The board members carefully examined him and decided he was inoperable and recommended that he be sent to the Los Angeles County Infirmary for medical palliation. He was cachectic and had lost a great deal of weight and was vomiting blood, and he was slowly starving to death. In addition there was a hard, fixed mass in the epigastrium which was estimated to be the size of a child's head. This man gave a perfect picture of a terminal intra-abdominal carcinoma. He was at the Los Angeles County Infirmary for a few weeks, and then he was brought in with some others to the Coffey-Humber clinic. He was assisted into the building by an attendant on each side supporting him. After nine injections of the extract he began to improve, and as you see him standing here today, he has gained twenty-five pounds in weight, he retains his food without distress, he has no cachexia, his nutrition is excellent, and, most remarkable of all, it is utterly impossible to palpate or find any abnormal growth anywhere in his abdomen.

The next patient whom I wish to present is one upon whom a laryngectomy was done by Dr. Simon Jesberg of Los Angeles. Six months after his operation this patient developed a mass under his left mandible estimated to be the size of a goose egg. The mass was hard, deeply fixed, and caused pain down the shoulder and along the side of the neck and into the ear. He was referred to my care by Doctor Jesberg for the removal of this mass. The patient, however, requested that before any further surgery was done, an attempt to cure him be made with the Coffey-Humber extract. He was sent to the Coffey-Humber clinic and the first effect of the injections was to cause about a two-thirds recession of the growth under the jaw. Following this, even with increasing doses of the extract, the growth began to enlarge and really regained its original size. In addition a new mass that was hard and fixed and about the size of a lima bean developed on the surface of the left parotid gland. In addition the pain returned, especially in the jaw and ear, this pain being sufficient to require opiates. The patient requested that he be operated on, but this was denied him for the reason that it was not certain that he would not still get benefit from the extract, and this proved to be the result. Under its continued administration, in about two weeks the growth gradually began to recede and at the present time there is absolutely nothing palpable either in the neck or over the parotid gland. You are at liberty to examine this patient when you see him in the anteroom.

I was very much interested in a statement just made by Doctor Cox of the American Society for the Control of Cancer, that the average physician sees but two or three of these patients a year. The truth of the matter is that many cancer patients never consult a physician, for somehow the public has been educated to believe that we have little or nothing to offer them, either in the way of palliation or cure. As a result these patients again and again go to every source for relief outside of the medical profession which they can find. We physicians must change our attitude toward the treatment of these patients with malignant growths. We could do a lot more for them than we now do with methods we already have if we used our procedures in the early stages. Too often, however, we drive them to the quacks, but are finally compelled to care for them when they return to us in the terminal stages of the disease.

Doctors Coffey and Humber have stirred up the public on the cancer question much as the San Francisco fire stirred up a lot of the derelicts in Chinatown of that city. The fire forced them out into the daylight and sunshine, something many of them had not seen for years. These two physicians have made the public "cancer conscious." They have made it respectable for people to acknowledge they are sufferers from the disease. It has also given lay persons and patients great hope, and it has stirred philanthropic men to set aside money for further investigations. For example, both in San Francisco and Los Angeles such organizations for the study of these questions have come into existence largely as a result of the experiences of these two men.

One of the patients concerning whom Doctor Humber showed x-rays on the screen and in whom there had been a recurrence in the right thorax following an amputation of the breast, had also had previous pre- and postoperative x-ray therapy two and a half years before. Over 800 cubic centimeters of fluid was aspirated every four days from the patient's right thorax. She was bedridden, breathless, losing weight—a perfect picture of a terminal case of recurrent cancer in the lung, and yet after the first injection of the extract no further tappings of the chest were required and this patient, clinically at least, if not entirely well is certainly so greatly improved as to consider herself well.

Another patient shown on the screen was a woman whom I saw in consultation, in the Hollywood Hospital, suffering from bone metastasis following an amputation of the breast. There was complete inability to move her body; she was taking morphin and receiving very necessary blood transfusions about every four days; and every long bone in her body, especially the pelvic bone, seemed honeycombed with malignancy. At the present time this patient is out of bed, travels about at will, drives her own machine, and apparently seems to be on the high road to a good recovery. The whole series of x-ray pictures in this woman is a most marvelous exhibition of calcification and filling up of these honeycombed areas toward a normal appearance, as seen in the last x-ray pictures.

We should remember that from its scientific aspects we know little or nothing about cancer. Unfortunately most every physician and surgeon when he sees a patient with cancer attempts to judge it, as far as its management is concerned, as if he did know something about it. As a result we are continually making the mistakes that are so often observed in the practical treatment of cancer. We should not assume that little or nothing can be done for cancer until we try some constructive form of treatment. It is certain that in a large percentage of cases something can be done to the average cancer mass with this extract that is outside of anything we have heretofore experienced in the treatment of malignancies.

I once asked Beneke of Germany, in whose laboratory years ago I spent several months, if anyone would ever be able to tell us the cause of cancer. He seemed to be lost in a reverie for a few moments and then replied with this Delphic remark: "He who first tells us the cause of cancer will be in a position almost to describe the anatomy of the human soul."

❦

Doctors Coffey and Humber (Closing).—In closing the discussion, there is only one point we wish to bring out. As we stated in our paper, we do not claim our extract is a specific. Any remedy to be classified as a specific has properties to destroy. We believe that malignant cells as such, are due to a perversion of their original function. The continuance or normal life of a cell depends upon its intrinsic properties or extrinsic influence. Abnormal action of either factor results in extinction or mutation into another form. Presumably this is intrinsic, due, as we believe, to a deficiency of an hormone or active principle. A supply of such active principle or hormone prevents a further mutation of normal cell function with an evolution or self-extermination of disfunctioning cells.

BASIC PRINCIPLES INVOLVED IN MODERN CONTROLLABLE SPINAL ANESTHESIA*

By Franklin I. Harris, M. D.
and
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San Francisco

FOR the successful administration of spinal anesthesia, a knowledge of its historical development is desirable. Lack of knowledge of the underlying principles of anatomy, physiology, and pharmacology has in the past prevented the proper development and usage of this valuable form of anesthesia.

HISTORICAL DEVELOPMENT

In 1885 Dr. J. J. Corning,[1] of New York, accidentally produced a paralysis of motion and sensation in a dog by the injection of two cubic centimeters of one per cent cocaine solution into the lumbar region. He continued his experiments on man, but not being a surgeon did not appreciate their significance. Quincke in 1891 introduced the idea of lumbar puncture and showed that cerebrospinal fluid could be removed with safety. Beir combined these two new thoughts and established the surgical application of spinal anesthesia by an experiment on himself and his assistants, using lumbar puncture, after the method of Quincke, and injection of two cubic centimeters of one per cent cocaine as suggested by Corning. After the appearance of Beir's paper, many surgeons throughout the world, especially in America and France, adopted the method.

The procedure, however, was popularized by Tuffier of Paris, who extended its application to the genito-urinary organs and the abdomen. Then, as in all new methods in medicine, many men proceeded enthusiastically to attempt all types of surgical operations under spinal anesthesia. They did not stop to consider the technique nor contraindications. The underlying physiology was not understood. Numerous reports of serious complications, such as severe depression of blood pressure and fatalities supposedly due to respiratory failure, consequently followed. At this time these fatalities were thought to be due to the well-known toxicity of cocaine and the procedure was deferred until less toxic drugs such as stovocain, trocaine, novocaine, etc., were discovered. Even following the use of these less toxic drugs undesirable symptoms were noted, such as an alarming drop in blood pressure and respiratory failure. The prevailing opinion was that these symptoms, especially respiratory failure, were due to the diffusion of the anesthetic solution in the spinal fluid to the medulla oblongata, thus reaching the center of respiration and blocking it off.

In an attempt to prevent the so-called diffusion of the drug to the higher centers, it was thought that the head must be elevated and in many in-

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*Read before the Anesthesiology Section of the California Medical Association, at the Fifty-ninth Annual Session, Del Monte, April 28-May 1, 1930.

stances the patient was kept in the sitting position during the operation. It also occurred to some of the pioneers that the injection of a solution heavier than the spinal fluid would be safe for all operations that could be performed in the sitting position; and the use of a solution lighter than the spinal fluid would be equally safe if the patient could be placed in the Trendelenburg position. So in 1908, Wayne Babcock [2] added milk sugar to make a heavier solution and alcohol to make a lighter solution. Despite the introduction of these new steps in the technique of spinal anesthesia (that is the use of a solution of variable specific gravity and of a posture which would prevent the diffusion of the anesthetic upward) the danger of circulatory and respiratory failure seemed still to be present and spinal anesthesia gradually lost its popularity and was considered a dangerous procedure. A few courageous men, such as Babcock and Gaston Labat, continued to use it with care and discrimination, at the same time gaining increased experience and a clearer conception of the physiological mechanism which produced the circulatory disturbance and respiratory failure.

SPINAL ANESTHESIA NOW BASED ON SCIENTIFIC KNOWLEDGE

Today, again a great wave of popularity for spinal anesthesia has swept throughout the country, and the demand for this type of anesthesia is increasing as the profession becomes better educated and has a clearer conception of just exactly what happens in the human body when novocain or any similar anesthetic drug, such as stovocain, is introduced into the spinal fluid.

Experimental pharmacology teaches us that novocaine, in common with all cocaine types of drugs, has a specific chemical affinity for nerve tissue. It is for this reason that in local regional block where we inject more or less blindly in so far as the exact location of the nerves supplying the area are, we obtain anesthesia because the solution specifically has an attraction to the nerves. Furthermore, experimental pharmacology has shown that novocaine has a much greater affinity for sensory nerve fibers than for motor nerve fibers. Thus, if novocaine is injected high up into the sciatic nerve of a frog, there is no reflex response to electrical stimulation distal to the point of injection, showing the sensory fibers are blocked; but stimulation central to the point of injection causes a contraction of the muscles of the entire limb, showing the motor fibers are not blocked by that particular concentration of the drug.

When novocaine is introduced into the subarachnoid space, it is being placed into the spinal fluid which bathes exposed nerve roots, whose histological structures are slightly different from the peripheral nerve fibers in that, within the spinal canal the nerve roots are not covered by the epineurium or connective-tissue nerve sheath present in all extradural nerves. Consequently, the novocaine is instantaneously attracted and rapidly combines with these nerve roots much as a blotter absorbs ink, with resultant instantaneous anesthesia of the region supplied by them. The gray or noble substance of the spinal cord is not affected by the drug because of its protective white sheath and because of the greater affinity of novocaine for the exposed nerve roots, especially the sensory nerve roots. Anesthesia, therefore, is due *not to a physiological section of the spinal cord* but rather to a blocking of the peripheral nerve roots within the dura in a manner similar to the anesthesia obtained by paravertebral injections. Hence, we see that the term spinal anesthesia is a misnomer, as we have no anesthesia of the cord, but only a sub-arachnoid block of the nerve roots coming off the cord. The novocaine acts like a dye, impregnating nerve tissues more deeply at the first point of contact, and the anatomy of the contents of the spinal canal is such that the posterior or sensory nerve roots offer the first point of contact. The anterior or motor roots receive less of the drug for two reasons: first, because they are less susceptible from the physio-chemical standpoint, and secondly, they receive a less concentrated solution of the injected drug because they are farther away from the site of injection and partially separated from it by the inter-arachnoid trabecullae. This then explains why we may have complete anesthesia of the lower limbs of the patient, yet he is able to move his legs. It also explains why Koster [3] of Brooklyn is able to perform operations on the head and neck without getting paralysis of the diaphragm. The anesthesia in this case being due mainly to blocking of the cervical posterior sensory roots, whereas the phrenic nerve supplying the diaphragm comes off these same cervical segments but arises from the motor or anterior roots.

EFFECT ON SYMPATHETIC FIBERS AND SPLANCHNIC AREA

We do not wish to give the impression that the introduction of novocaine into the spinal canal produces no effect on the anterior or motor roots. The point we have made so far is that the bulk of the novocaine is absorbed by the posterior or sensory roots. That the anterior roots are affected also is definitely shown by the effects produced on the sympathetic nerve fibers present in the anterior roots. A study of these effects will help to an understanding of the cause and correction of the dangers formally associated with spinal anesthesia.

From the second thoracic to the second lumbar segment there are present sympathetic nerve fibers which emerge from the anterior roots by way of the white rami communicantes and join the abdominal and thoracic sympathetic chain as pregangliated fibers. These fibers carry vasoconstrictor impulses which keep the great splanchnic bed of blood vessels in a state of constant contraction. In the thoracic region they carry impulses which accelerate the heart beat in opposition to the impulses of the vagus, which tend to slow

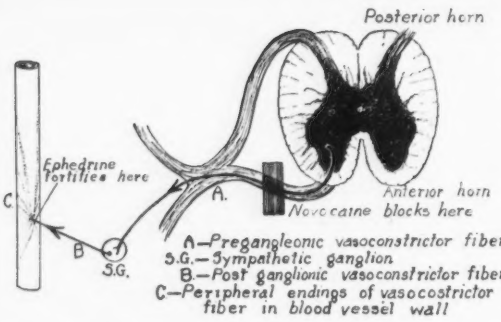


Fig. 1.—Illustration showing why ephedrin prevents a drop in blood pressure even though the vasoconstricture fibers in the anterior roots are anesthetized.

the heart beat. If all of these fibers are cut in the experimental animal, there is at once noted a tremendous dilatation of the blood vessels of the splanchnic, causing a pallor of the peripheral tissues with a marked drop in blood pressure. The heart is also slowed, due to unopposed action of the vagus, and the animal finally dies because it bleeds to death into its own splanchnic and has no blood left to oxygenate its vital cerebral centers.

In the human being the introduction of novocaine into the spinal canal may result in a physiological section of the sympathetic fibers present in the anterior horns of the cord, and as these fibers carry constant contractile impulses, there results a relaxation of all the splanchnic blood vessels with a loss of tonus of the blood vessel walls. This affects the contractility of the blood vessel and minimizes its ability to resist the heart wave so that a profound drop in blood pressure results. The action of the heart being also reduced by blocking the cardio-accelerator fibers in the sympathetic system, the waves sent out at each systole are imperceptible and the circulation is slowed.

ANEMIA DUE TO POSITION

A system of circulation depending chiefly on gravity is now established during which the lowest or most dependent parts of the body are rich in blood, the elevated parts becoming poor and anemic. If the head is kept elevated, the brain suffers from acute anemia, which produces respiratory disturbances ranging from embarrassment and the classic air hunger to complete respiratory failure. The pallor, cold sweats, nausea, and vomiting, likewise can be explained by anemia of the vital cerebral centers, not by the diffusion of the anesthetic drug to these centers as was formerly thought. The assumption that the injected novocaine was diffused to the brain and produced these respiratory and circulatory disturbances is refuted by clinical findings and is contradicted as well by laboratory findings.

Koster and Kaman recently proved by experiments on frogs, using a larger dose of novocaine than that ordinarily used in the human and applying it directly to the respiratory center in the medulla, that it did not cause any respiratory embarrassment.

It can now be definitely stated that death during spinal anesthesia is due to an acute anemia

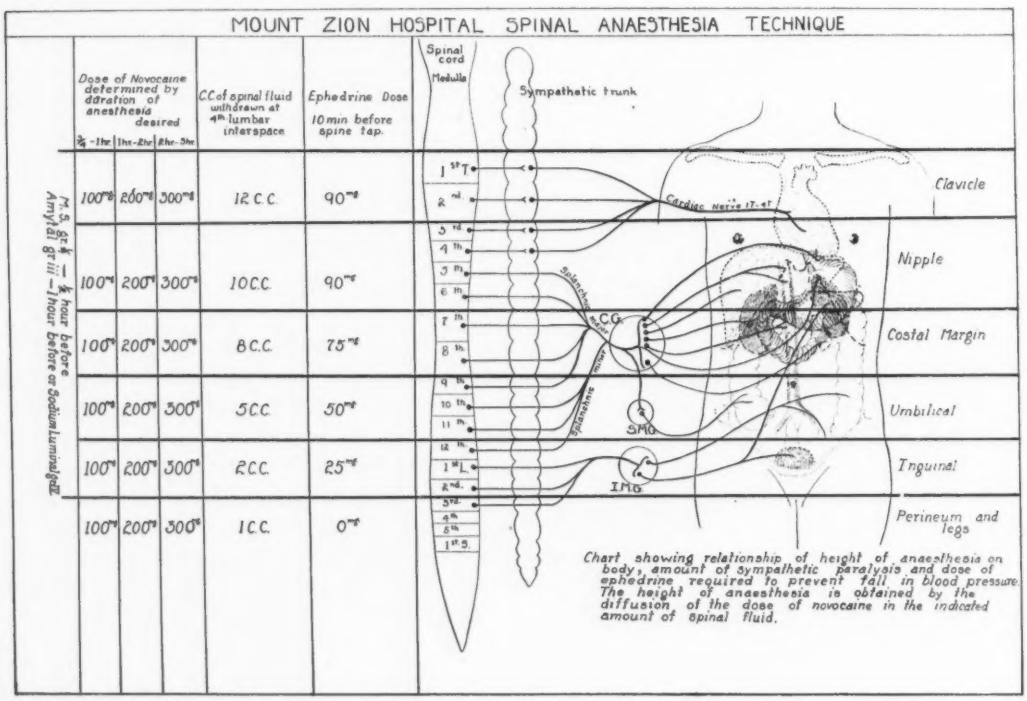


Fig. 2

of the brain, not to anesthesia of the respiratory or vital centers.

With this understanding, *the reason and the indication for the immediate* use of the Trendelenburg position in every case of spinal anesthesia becomes very clear.

FALL IN BLOOD PRESSURE—CAUSE AND TREATMENT

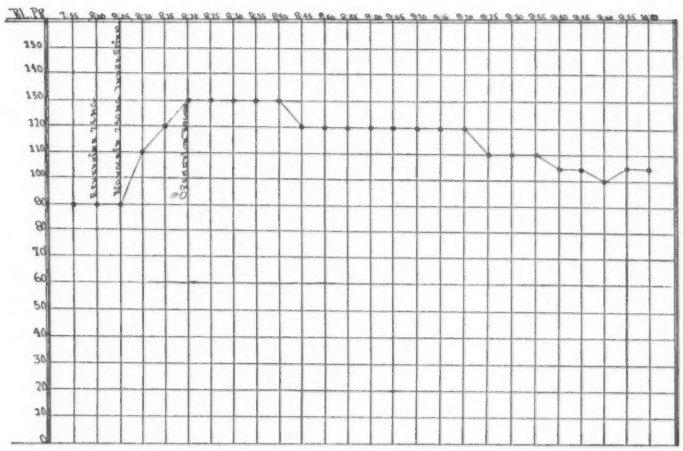
The severity of the fall in blood pressure and the resultant circulatory disturbance just described will depend upon the number of sympathetic vaso-constrictor fibers involved in the anesthesia. If the anesthesia extends only as far as the second lumbar nerve roots, there should be no involvement of any sympathetic fibers and no drop in blood pressure. Clinical results prove such to be true. If the anesthesia reaches to the first thoracic segment all of the sympathetic fibers will be involved and there will be a maximum drop in blood pressure. If it reaches only to the sixth thoracic, a drop in blood pressure follows, but not with the degree observed in the higher anesthesia just mentioned.

Thus by remembering that spinal anesthesia is simply a segmental nerve root block, one can understand and often predict the severity of the vasomotor collapse that may accompany it. It is this contribution of Gaston Labat[5] that has made possible spinal anesthesia without the danger to life and without the embarrassing symptoms of pallor, cold sweats, nausea and respiratory embarrassment which so baffled the early workers in this field.

Today, we have not only the Trendelenburg position to combat this fall in blood pressure, but we have also an effective drug which is a physiological antidote to the effect of novocaine on the sympathetic vaso-constrictor fibers. We refer to ephedrine. The pharmacology of this drug has been worked out very completely by Chen and Schmidt.[6] They have shown that the drug produces a rise of blood pressure by a direct action on the peripheral ends of the vaso-constrictor fibers in the walls of the blood vessels.* Therefore although the pregangionic vaso-constrictor fibers may be blocked by the novocaine in the anterior horn of the spinal cord, if ephedrine has been previously injected, it has already fortified the peripheral ends of the vaso-constrictor fibers in the blood vessel walls so that there will be no dilatation of the vessels and no drop in blood pressure. Moreover this action of ephedrine (see graphic chart No. 1) in contradistinction to adrenalin lasts a sufficient length of time to allow the anesthesia of the vasomotor to wear off and again conduct normal vaso-contractor impulses.

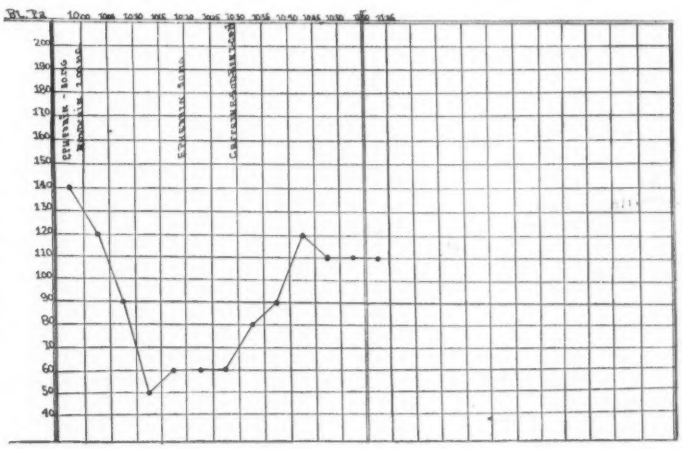
The ephedrine must be given from five to fifteen minutes before the novocaine is introduced into the spinal canal, the average time being ten minutes. If given later, (see graphic chart No. 2) its effect is not produced because the slowing of the circulation prevents its rapid absorption and

Hospital No. 83. Vaginal Plastic. Hysterectomy—Supravag. Umbilical Anesthesia.



Graphic Chart No. 1.—Illustrating how an extra dose of ephedrin may raise and maintain the blood pressure above normal during an operation. For umbilical anesthesia 50 milligrams would have been sufficient, but as the patient's normal systolic was only 90, an extra dose was given with a resultant well maintained blood pressure.

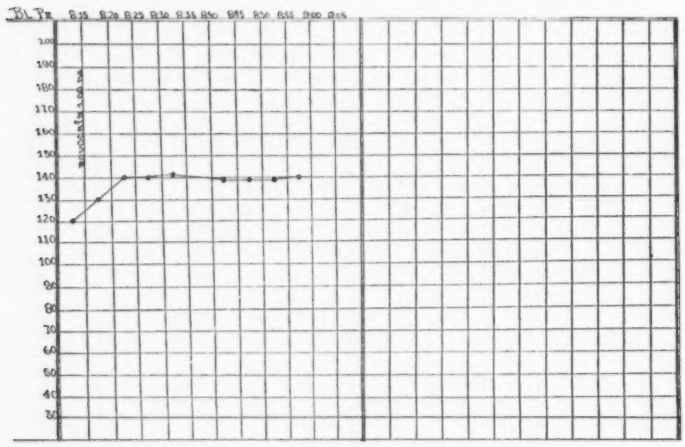
Hospital No. 14800. Operation Cholecystogastrostomy.



Graphic Chart No. 2.—Showing the result of giving ephedrin too late. It was here given simultaneously with the injection of the novocain intraspinally. It did not have time to act, so there was a pronounced drop in blood pressure. It must be given from five to fifteen minutes before the spinal tap.

* Recent work by Tainter seems to indicate that ephedrin acts directly on the smooth muscle of the blood vessel itself. However, this point is purely of academic interest, as clinically the result is the same.

Hospital No. 6716. Hemorrhoidectomy. Perineal Anesthesia.



Graphic Chart No. 3.—Illustrating the fact that no ephedrin is needed and there is no drop in blood pressure when only a perineal anesthesia is obtained.

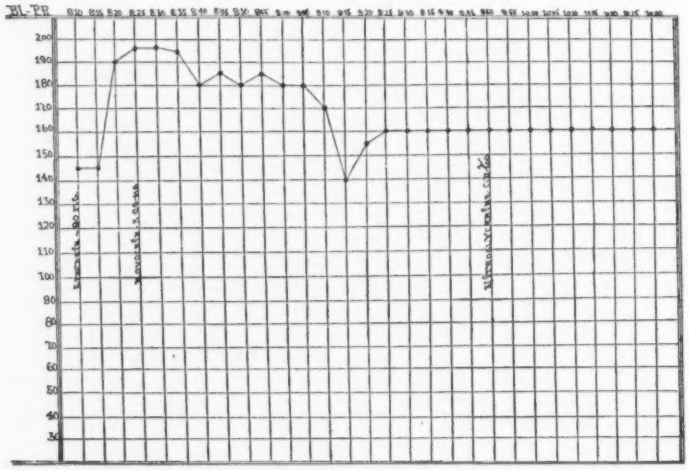
distribution to the peripheral vaso-constrictor ends.

The introduction of the Trendelenburg position and ephedrin into the spinal anesthesia technique having eliminated all dangers due to a drop in blood pressure, those interested in the development of this form of anesthesia have now turned their attention to a study of the methods of controlling the height and duration of the anesthesia produced.

SEGMENTAL ANESTHESIA

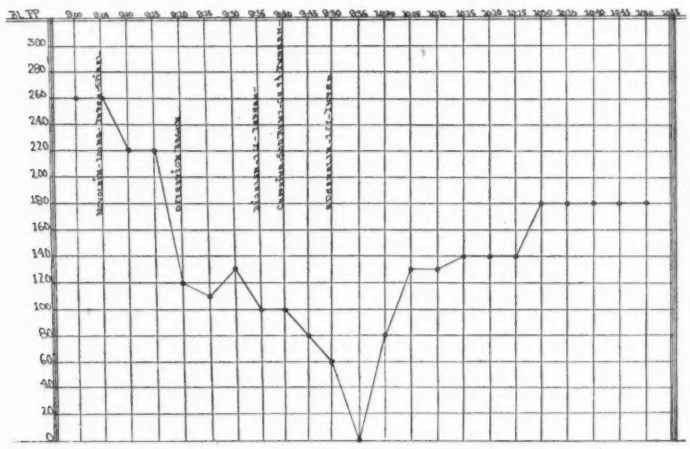
Study along these lines is not only of recent origin, but dates back to the beginning of this subject. It was early recognized that although there is a circulation of the cerebrospinal fluid, it is not very active or very strong, and proved by studies by Dandy and also by Solemn. Solemn injected a dyestuff, phenosulphophthalein, into the spinal canal in the lumbar region, and then withdrew cerebrospinal fluid from the cisternal region at varying intervals of time and tested for the presence of the dye. His results lead to the conclusion that under ordinary conditions there is not very much movement from one locus to another of a substance introduced into the cerebrospinal fluid. More recently Ernest Sachs [7] and his co-workers have confirmed by direct experimentation the fact that there is no active circulation in the cerebrospinal fluid, but that the diffusion of substances introduced into the spinal canal is determined only by the physical laws of diffusion. Hence, assuming other factors are constant, if novocaine is introduced into the second lumbar interspace, it will bathe the nerve roots only at that level and anesthesia will be produced only in the region supplied by the nerve fibers coming off the cord at approximately that level. This is the basis for Jonenesco's work, who claims to get true limited segmental anesthesia. Thus he injects into the mediothoracic region and gets a limited anesthesia of the upper abdomen and lower thorax and no anesthesia either above or below these regions. If he wishes only anesthesia of the neck and the upper chest, he injects into the midcervical portion of the spinal canal and obtains no anesthesia of the body below that level. His method, however, is objectionable and dangerous because of the possibility of injury to the spinal cord by the high injections. As circulation of the spinal fluid cannot be relied upon to raise or lower the level reached by the introduced novocaine, control of the height of anesthesia must be secured in some other way. The early workers attempted to control the height of anesthesia by using a solution of specific gravity different from that of spinal fluid and tilting the body; thus with a heavy solution they assumed that by raising the upper part of the body to a certain angle they would hold the novocaine to a certain level low in the body, whereas by lowering the head and shoulders with a heavier solution, they would obtain a proportionately high anesthesia. With a solution of lighter specific gravity, the reverse procedure was supposed to be true. These attempts at controlling the height of anes-

Hospital No. 14783. Vaginal Hysterectomy. Anterior-Posterior Colporrhaphy.



Graphic Chart No. 4.—Illustrating 2½ hours' duration of anesthesia obtained by 300 milligrams of novocain and effects of overdose of ephedrin. Ninety milligrams given by mistake for anesthesia to umbilical region where only 50 milligrams are required.

Hospital No. 1035. Supra-Pubic-Prost atectomy. Costal Margin Anesthesia.



Graphic Chart No. 5.—This case illustrates a common misunderstanding. The operator obtained a high anesthesia up to the costal margin for complete relaxation, but did not believe any preliminary ephedrin was necessary, as the man's "normal" pressure was 260 millimeters systolic. The result is a complete collapse of the splanchnics with the pressure dropping to zero and gradual recovery after both operator and patient had received a severe shock.

thesia by lighter and heavier solutions of novocaine combined with posture of the patient were not entirely satisfactory.

FACTORS CONTROLLING HEIGHT OF ANESTHESIA

Upon what factor, then, does height of anesthesia depend? The answer is apparent if we review the work of Le Filleatre during the World War. He obtained a general anesthesia of the entire body by performing a spinal puncture low in the fifth lumbar interspace, withdrawing a large amount of spinal fluid, thirty cubic centimeters, mixing with the anesthetic agent and reinjecting with great force. After reinjection, new fluid was again immediately withdrawn and reinjected several times. In this manner he produced a complete anesthesia so that soldiers with multiple wounds in different parts of the body could be attended to by several surgeons at the same time. This work shows that the height of anesthesia can be raised by diffusion of the novocaine in the spinal fluid by a process of mixing.

We can deduce from this work and from our own experience that for all practical purposes, *the height of anesthesia is directly proportional to the volume of cerebrospinal fluid used as a diluent of the novocaine crystals.* Although admitting that other factors may influence the diffusion of novocaine in the spinal fluid, such as speed of injection, differences in specific gravity in solution, gravity as influenced by the position of the patient, and cerebrospinal fluid pressure, our experience has convinced us that for simplicity and the practical application of controlling height of anesthesia, we need only consider the amounts of spinal fluid we have withdrawn to mix with our crystals of novocaine.

These amounts are determined by the known capacity in cubic centimeters in the spinal canal at different levels. This contribution we owe to Pitkin's [8] recent excellent work, and although we have abandoned his technique in other details, we have on the average confirmed his findings as to the capacity of the spinal canal at various levels with slight variations.

Thus the capacity of the spinal canal from the sixth thoracic vertebra to the lower lumbar region is about eight to ten cubic centimeters. If we desire to obtain anesthesia up to the nipples, we perform a low lumbar puncture and withdraw and reinject ten cubic centimeters of spinal fluid into which novocaine has been dissolved. In other words, we dissolve, or as Pitkin says, expand our novocaine into ten cubic centimeters of spinal fluid, and this will give us an anesthesia to the nipple line. If anesthesia is only desired to the umbilicus, we dissolve our novocaine with only five cubic centimeters of spinal fluid; if for the inguinal region, we dissolve or mix, as Pitkin says, with only two cubic centimeters, and if anesthesia of only the perineum, withdraw one cubic centimeter spinal fluid, and reinject slowly the given dose of novocaine. (See chart No. 3.)

DURATION OF ANESTHESIA

The problem of controlling the duration of anesthesia is relatively simple. For years it has been thought that one hour is the maximum time for spinal anesthesia. This is because the dosage of novocaine, heretofore commonly given, varied from one to one-half grains, or approximately 100 milligrams. We are unable to find out on what basis this arbitrary dosage had been determined. Elsewhere in the body we often inject from 500 to 1500 milligrams of novocaine in the form of one-fourth to one-half per cent solution, and there is no reason why larger doses of novocaine cannot be employed in the spinal canal, and if this is done, the anesthesia will be prolonged accordingly. We believe the important factor controlling the duration of anesthesia is simply the dosage of novocaine; 100 milligrams, or one and one-half grains, gives approximately one hour; 200 milligrams gives approximately two hours; 300 milligrams approximately three hours, and with our newer knowledge of spinal anesthesia we can safely give these larger doses of novocaine intraspinally. (See chart No. 4.)

BARBITAL TO COMBAT TOXIC IDIOSYNCRASY

Recognizing the fact that occasionally we may encounter a patient who has a toxic idiosyncrasy to the cocaine derivatives, we have adopted the routine use of the administration preoperatively of some barbital derivative. This drug has been

shown to be an antidote to cocaine poisoning. Moreover, the preliminary administration of such a drug about an hour before the patient enters the operating room has the effect of quieting the apprehensiveness of one about to undergo an operation without deprivation of consciousness.

Based on the principles advanced in this paper, we are submitting a chart of a simple technique which should produce a safe and controllable form of spinal anesthesia. With this simplified technique, the application of a spinal anesthesia is made possible for any operative procedure involving any part of the body from the toes to the neck. With this technique, we may produce the same anesthesia as can be obtained by the methods known as splanchnic, paravertebral, sacral and epidural anesthesia, but with the advantage over all of these methods that this technique is simpler, more certain, and quicker in producing anesthetic facts.

UNIVERSAL APPLICABILITY QUESTIONED

Although our purpose in this paper is to explain the theory underlying spinal anesthesia, we wish to emphasize a few salient features, based on our experience with five hundred patients. This form of anesthesia is not applicable to every patient despite enthusiastic claims of many centers. There are certain people who psychically are unfit for any operative procedure except one under general narcosis. To force spinal anesthesia on such patients only brings a valuable method into disrepute.

We believe children under the age of twelve fall within this category and although we have successfully administered this anesthesia to many children, we believe it is unwise and in the last year have made a rule that children be given general anesthesia only. The frightened, crying child is not a good advertisement for any form of local anesthesia.

PRECAUTIONS ADVISABLE

The presence of a competent anesthetist is of the utmost importance. In cases of prolonged operations, while the anesthesia does not wear off, the patient may become physically and mentally tired and require a light gas anesthetic for this reason, toward the completion of the operation.

The maintenance of the patient's normal blood pressure, even though that blood pressure be abnormal, is the constant object in this technique. (See graphic chart No. 5.) A patient with a systolic pressure of 220 upon whom a cholecystectomy is to be done must receive seventy-five milligrams of ephedrine, just the same as one whose systolic pressure is 110. Our object is to prevent the wide swings in blood pressure which formerly accompanied all spinal anesthesia cases.

Failure to obtain anesthesia is usually due to displacement of the needle during the process of withdrawal of spinal fluid and reinjection after the novocaine crystals are dissolved. The needle may inadvertently be pushed through the anterior portion of the dura and the solution deposited extra-durally. This occurred in about 0.5 per cent of our cases.

Our incidence of headaches has been negligible and we believe no more severe than the headaches patients occasionally complained of following general anesthetic and operative procedures. Headache is caused by the use of the old-fashioned large spinal needle, which permitted leakage of the spinal fluid after the tap. We think the less foreign substance is introduced into the spinal canal, the less the chance for headache due to an irritative meningismus. This is one reason why we have discarded the use of spinocain in favor of pure crystals of novocaine or the French neocaine dissolved only in cerebrospinal fluid.

In our series of five hundred cases we have had no complications or untoward results. In conclusion we offer our graphic chart, which illustrates the theory and practice of a simplified, controllable form of spinal anesthesia.

450 Sutter Street.

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AMEBIC ABSCESS OF THE LIVER—ITS TREATMENT

By E. D. Kilbourne, M. D.
Santa Ana

Discussion *by H. H. Searls, M. D., San Francisco; Clarence G. Toland, M. D., and William P. Kroeger, M. D., Los Angeles; Alfred C. Reed, M. D., San Francisco.*

AMEBIC abscess of the liver is often thought of as something necessarily tropical and distant, and not likely to be met in temperate zones. An examination of the autopsy and hospital records in the United States will show that this complication of amebiasis is not uncommon and will convince us that it must be kept in mind when considering pathological conditions of the right hypochondriac region.

Years ago about 20 per cent of the persons suffering from amebic dysentery would get abscesses, but this proportion has been greatly reduced in localities where proper treatment with emetin, ipecac, or other efficacious drugs could be given.

Ludlow says abscess is easily preventable; that he has not seen the complication in properly treated cases.[1] I do not share his enthusiasm, but believe the number of abscess cases can be greatly reduced by proper treatment of the dysentery. Cases have been reported long after the dysentery has disappeared; in one case as long as thirty years.[2]

We must not forget that abscess may occur without any previous history of dysentery or even transient diarrhea, the so-called primary hepatic amebiasis; the amebae getting into the blood stream and liver without doing enough damage to the intestines to cause symptoms.

INCIDENCE

During the last five years the General Hospital of Los Angeles has had an average of twenty and six-tenths admissions per year for amebic dysentery and nine cases per year for liver abscess. Much the same ratios obtain in the remainder of the United States. Therefore we cannot disregard its presence and should be ready to treat it with adequate surgical procedures.

Recent reports from different parts of the United States, of surgical experiences with abscess, indicate that the attending physicians were taken somewhat by surprise and also show that the patients did not have the benefit of the best surgical procedures. Following our early years in the Philippine Islands and Panama a technique was evolved that gives excellent results and, until something better is found, should be followed in cases of abscess or suspected abscess.

DIAGNOSIS

The question of treatment is inseparable from that of diagnosis, and they must be considered together. The diagnosis may sometimes be made, with little chance of error, from history, signs, and symptoms, but it is often necessary, especially in the early cases, when we can do the most good, to put a trocar into the liver in an effort to locate the pus. If it is done without a preliminary laparotomy, the point of election is in the midaxillary line through the eighth interspace. From this point one-half the liver can be searched. The epigastric route also may be used. A point of tenderness often determines the point of puncture. The needle should not be more than three and three-quarter inches long. The x-ray is of assistance. I have described this method of puncture only to condemn it, except in cases where the liver and abdominal wall are adherent and the location of the abscess so evident that a needle puncture could not miss it and soil the general abdominal cavity.

ASPIRATION AND OPEN OPERATION METHODS

Surgeons have always been divided as to the best method of treating liver abscess. One school, in which most British and European surgeons are found, believes that liver abscess should be drained by aspiration and that by this procedure and the exhibition of emetin hypodermically or ipecac orally, operation will be unnecessary in most cases. A. R. Neligan says: "There is no doubt that both for the patient and the surgeon, the aspiration treatment is preferable in every way to open operation for the great majority of liver abscesses. I feel, indeed, that, with one exception, incision of a liver abscess is as much to be avoided as incision into a tuberculous abscess." "The exception mentioned above is the abscess in the epigastric or hypochondriac regions, which presents no definite evidence of having formed adhesions with the parietes. Here it is safe to incise the abdominal wall, pack off the peritoneal cavity, and drain." [3]

K. K. Chatterji successfully treated thirteen cases by aspiration, emetin injections and ipecac by mouth. In two, the aspirations had to be repeated.[4] Rogers and Wilson gave like reports.[5] A. I. Ludlow says from an experience of one hundred operations that there is little danger from aspiration and that, although it sometimes must be followed by open operation, it gives a gain in time and strength.[1] S. N. Hayes says: First, for all patients with the liver enlarged to two-finger breadths below the costal margin, give emetin injections alone. He gives it in two or three courses of eight days, with one week between. After the first course the patients are usually well enough to be attended as out-patients. Second, in patients with a greater enlargement or a definite fluctuating swelling, or in those who resist emetin alone, add aspiration to the emetin. Third, for patients who fail to respond to the above, use emetin and siphon drainage.[6] Several other observers have reported patients with emetin alone. Some after aspiration use emetin, ipecac, or quinin solution to irrigate the cavity.

The opponents of open operation give the mortality rate as over 50 per cent in open operation as compared to 14.4 per cent with repeated aspirations and medical treatment.[7] As will be shown later, this mortality rate for open operation is much too high; in the hands of competent men it is lower than the rate quoted for aspiration. Most American surgeons believe open operation to be the best method.

Exploration by needle, without preliminary laparotomy, is dangerous. One cannot thoroughly explore the liver in this way without great danger to the large vessels, the gall bladder, and other abdominal organs. If done through the chest wall there is danger to the pleura and lung. Added to those dangers is the greater one of infection. Strong says 50 per cent, and Rogers states 14 per cent of abscesses contain bacteria. I believe Strong's 50 per cent is nearer correct than Rogers' 14 per cent. Besides the dangers of the method, it is inefficient and not to be compared with palpation of the liver by the whole hand introduced into the abdomen, using the needle for investigating any suspicious spots. An incision in the abdominal wall, either parallel to and just below the costal border, or vertical may be used. Rhoads described the feeling of abscess as "resistant tense bogginess."[8] This palpation of the whole liver gives us our best chance to find small and multiple abscesses and those that

are located on the superior posterior aspect at the peritoneal reflection and near the vena cava. Many abscesses have been missed in this location.

TREATMENT PROCEDURES

After locating the abscess it may be isolated by packing and then opened, or it may be opened later after adhesions have formed about the packing. Sometimes shrinkage occurs, so one may leave the needle or trocar in place surrounded by packing as a guide to the subsequent opening.

It is often impossible to drain the abscess through the abdominal incision and it is then necessary to approach from another direction. After locating the abscess by intra-abdominal palpation, one can see just where it lies in relation to the ribs and determine which of the latter should be resected to give direct approach. Those cases where liver dullness extends downward and those of left lobe abscess are most favorable for drainage through the anterior abdominal wall.

After marking the site of the abscess the abdominal wound is closed. Should it be below the ninth rib, in or anterior to the midaxillary line, one may do a subpleural operation by resecting three or four inches of the tenth rib, and go through the diaphragm below the pleural reflection. Or one may perform the transpleural operation by going through both layers (parietal and diaphragmatic) of the pleura and diaphragm to reach the abscess. In such procedure we must prevent pneumothorax and empyema if possible. The best way to prevent both is, I believe, as follows: Resect subperiosteally four inches of the rib best suited to drain the already located abscess. Select the lowest rib possible: get as far down into the acute lower pleural angle as you can, for it is there easier to approximate the chest wall and arching diaphragm. If this approximation seems difficult, resect another rib to make the wall more flaccid. While an assistant makes the approximation, by pressing from the outside, cut through the chest wall, parietal pleura, diaphragmatic pleura, diaphragm and parietal peritoneum, and clamp together the edges of all these structures to prevent the entrance of air into the pleural cavity. Sew the edges all around and remove the clamps. The mark of the previous needle puncture on the surface of the liver is now seen, and the abscess opened. Some operators instead of opening immediately, leave the needle in the abscess, pack all around with gauze, and wait for adhesions to wall off the exposed area. Some cases permit this delay, some do not. If hemorrhage from the liver should be great, pack the cavity with gauze, using a vaginal speculum or uterine packer.

Although I do not consider it the best surgical procedure, one may do the transpleural operation without preliminary intra-abdominal manual examination in two stages. After resecting the rib and going through the pleura, diaphragm, and parietal peritoneum, as described above, pack and wait for the adhesions to form about the packing down to the liver. Then explore with the needle every day until the abscess or abscesses are located. A soft rubber tube for two or three days provides best drainage.

Sometimes two or more cavities, lying close together, may be converted into one and drained through one opening. With multiple abscesses the chances of recovery are greatly reduced. One may successfully drain three separate abscesses but seldom four or more. When they are located between the layers of the coronary ligament, in the portion of the liver not covered by peritoneum, they are most difficult to locate and drain, and are usually missed.

PROGNOSIS

After open drainage operation the prognosis is good. Complete recovery occurs unless too much liver tissue has been destroyed.

In a period of ten years before the year 1915, the Surgeon-General of the United States Army reported two hundred and one operations for abscess, with twenty-five deaths; or a rate of 12.4 per cent, which is lower than that claimed by the advocates of aspiration.[9] In good hands the open operation gives the best immediate results and reduces very much the chances of overlooking a small abscess. It also allows examination of the coexisting conditions in the abdomen.

In treating these cases or in making certain the diagnosis in suspected cases, I would strongly urge that the abscess or abscesses be located by palpation with the whole hand introduced through a laparotomy wound before any effort is made to blindly search the liver by needles or trocars. One might, on first thought, consider that such preliminary laparotomy would add an unwarranted surgical procedure and increase the mortality rate in treating these cases, but such is not so. The added accuracy in locating abscesses, the lessened chance of overlooking small ones and those near the coronary ligament, and the increased safety in draining pus, often containing pyogenic bacteria, through the peritoneal and pleural cavities make this a necessary step in the operation, except, as mentioned before, when the liver and abdominal wall are adherent and the location of the abscesses certainly known.

CONCLUSIONS

1. Although amebic abscess of the liver is met much less frequently since the advent of emetin, it is not uncommon in the United States and we must be prepared to treat it properly.

2. Medical treatment by ipecac, emetin, and other drugs, prevents many abscesses, but it is not sufficient treatment after they have formed.

3. Blind exploration and aspiration by needle is inefficient and dangerous.

4. Location of the abscess or abscesses, preliminary to evacuation, should be made by intra-abdominal palpation by the whole hand.

5. The abscess cavity or cavities may be drained most advantageously by abdominal, subpleural, or transpleural routes after such accurate localization.

6. Increased accuracy in locating and subsequently draining abscesses more than compensates for added surgical trauma.

Moore Building.

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DISCUSSION

H. H. Searls, M. D. (University of California Hospital, San Francisco).—Doctor Kilbourne's article is apparently based on a considerable experience in this rather unusual condition. It would appear to me that his conclusions are sound for the most part. Certainly exploration of any condition within the abdominal cavity by means of a needle is a dangerous and rarely advisable procedure. It would seem, however, that when a single amebic abscess of the liver is located in the right lobe, and when it is sufficiently large to permit of definite localization by physical examination and x-ray, exploratory laparotomy might be unnecessary. The abscess may be reached by the transpleural route or by the approach suggested by Ochsner and Mather. These men suggest excision of the right twelfth rib and approach beneath the diaphragm to the unperitonized surface of the liver, securing drainage without entering either the peritoneal or pleural cavity. If the transpleural route is decided upon, it is certainly much safer to develop it in two stages, first resecting the rib and suturing the costal to the diaphragmatic pleura, packing the wound, waiting forty-eight hours and then proceeding through the fused pleural layers and the diaphragm to the liver.

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Clarence G. Toland, M. D., and William Paul Kroger, M. D. (1930 Wilshire Boulevard, Los Angeles).—In Doctor Kilbourne's very excellent paper on amebic abscess of the liver he mentions the fact that in many cases the occurrence of the abscess could be prevented by instituting proper treatment against the amebic intestinal infection.

It might be well to stress this point when we consider that approximately 90 per cent of these abscesses are preceded by an intestinal ulceration, allowing the amebae to slip into the portal circulation and thus lodge in the liver capillaries. A necrobiotic action is exerted upon the hepatic cells, softening and liquefaction occur, and an abscess is the result.

The ulceration is relatively a late manifestation of the amebic process and it seems logical to assume a case properly treated in its incipiency will probably not proceed to the ulcerative stage.

The amebae seem to have a predilection for the sigmoid colon, an area easily accessible to hot colonic irrigation; a procedure that frequently will be found a valuable adjunct to the emetin and other drugs used. The temperature of the water used for the irrigation must be over 47 degrees centigrade, for it has been definitely shown the *Ameba histolytica* cannot survive at this temperature.

The early diagnosis of amebic abscess of the liver is not so readily made, but the condition must always be suspected in the presence of the triad of fever, enlargement of the liver, and pain. Add to this the discovery of the parasites in the stool, and an exploratory puncture of the liver is justifiable.

The technical features of the puncture as outlined and advocated by Doctor Kilbourne may seem a bit radical to some, but his method most certainly eliminates the possibility of error. The location and size of the abscess or abscesses is definitely determined, and the incision and drainage can thus be accurately planned. An abscess properly evacuated usually closes. It is well to remember that occasionally an autopsy reveals a large undisturbed amebic abscess lying in close proximity to a small one that had so hopefully been incised by the surgeon.

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Alfred C. Reed, M. D. (384 Post Street, San Francisco).—The paper by Doctor Kilbourne is refreshingly practical and at the same time comprehensive. A few points under this subject have been emphasized in my own experience.

The only known portal of entry of *Entameba histolytica* into the human body is through the wall of the intestine. The presence of *Entameba histolytica* in the body anywhere, therefore, presupposes a lesion of the intestinal wall, nearly always in the colon. The pathology associated with amebic colonization is the same, whether the focus is in the mucosa, the submucosa, the liver, or elsewhere. A small sterile abscess, at first pin-point or microscopical in size, forms and tends to enlarge or discharge in the line of least resistance. This leads to open ulceration of the colonic mucosa or to massive abscess where discharge is not secured. It is therefore probable that so-called amebic hepatitis is actually a process of multiple, minute abscess formation. Secondary bacterial infection is prone to follow. The result is that the effectiveness of emetin and other amebicidal drugs is proportional to the amount of space occupied by the abscess, to the accessibility of the amebic colonies, to the mass of contained material, and to the variety and quantity of bacterial infection.

Not infrequently it happens that amebic abscess of the liver occurs when no amebae can be found in the stools. It frequently happens that amebic abscess occurs in a patient who has never had dysentery or even diarrhea. I have described "nondysenteric amebiasis" as the predominant type in temperate climates. The question is far from settled as to whether tendency to abscess and dysentery is inherent in certain races or species of ameba, or whether this tendency is a matter of host peculiarity or change in virulence of the ameba due to rapid passage from host to host or other causes.

In the matter of treatment of liver abscess, I have seen numerous cases in Europe, Egypt, and India treated by amebicidal drugs and aspiration of abscess contents. So uniform are the good results and so decreased the risks that this procedure seems to me decidedly the method of choice.

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Doctor Kilbourne (Closing).—I believe laparotomy is necessary whether the abscesses are single or multiple, except when the liver is adherent to the abdominal wall, thereby making needle puncture relatively safe. Even then one must guess at what is happening in the remainder of the liver.

The fact that many cases are successfully treated by aspiration does not militate against the whole hand exploration, for with the latter method many abscesses will be found that would be missed by simple puncture without laparotomy.

An occasional patient saved is the reward for the extra operative work. It is most distressing to find at autopsy an unopened abscess or abscesses that might have been drained had the whole liver been palpated.

CAROTINEMIA*

REPORT OF CASES

By HIRAM E. MILLER, M. D.
San Francisco

DISCUSSION *by George F. Koetter, M. D., Los Angeles; C. Ray Lounsberry, M. D., San Diego.*

THE lipochrome pigments—carotin and xanthophyll—when taken into the human body in abnormal amounts, may cause a peculiar yellow discoloration of the skin. It is frequently seen in diabetic persons, probably due to a diet rich in vegetables and not associated with a disturbed metabolism. This color change is generally harmless but it is of some diagnostic interest.

It has been shown that carotin is the pigment present in cows' milk, in the blood of horses, in egg yolk, and in the skin of chickens. The lipochrome causing the discoloration of the skin in man is chiefly from carotin, while in animals it is from xanthophyll. These pigments are found in carrots, most green vegetables, squash, skin of oranges, milk, and egg yolk.

In 1904, Von Noorden [1] described the clinical characteristics of carotinemia and named it "xanthosis diabetica," as he believed that it occurred only in diabetic individuals. Van den Bergh and Snapper [2] in 1913 demonstrated the presence of carotin in normal human blood serum. They also found comparatively large amounts of it in the serum of diabetics with a yellowish discoloration of the skin. In 1919 Burger and Reinhart [3] spectroscopically demonstrated carotin in the serum of diabetic patients on a diet rich in vegetables. Hess and Meyers [4] in the same year, first used the term carotinemia in reporting examples of the disorder in children. The Japanese literature [5] contains reports of many cases in natives from a diet rich in oranges and squash. In 1926 Greene and Blackford [6] reported a series of cases from the Mayo Clinic in non-diabetic individuals, most of whom were suffering from some form of neurosis. Conner [7] of the department of pathology, University of California Medical School, in 1928 published the results of his experimental and biochemical studies on these lipochromes. Rabinowitch [8] in the same year reported fifty-nine cases of carotinemia in a series of 1014 diabetic patients. He stated that he believed that patients with this discoloration had a less favorable prognosis than other diabetics. Wise [9] in December, 1929, reported a case of carotinemia with excellent colored photographs.

CLINICAL MANIFESTATIONS

The yellow discoloration of the skin is most marked on the nasolabial folds and on the palms and soles. In some individuals the skin of the entire body may be involved, but this generally remains for only a few days. On the hyperkeratotic areas and wherever the sebaceous glands are most numerous, the pigment is retained in greater concentration and for longer periods of time than elsewhere. The pigment is of a lemon, ochre, or canary yellow, color. The sclera are not pigmented in carotinemia while in true icterus they are always involved. There is never an associated pruritis in carotinemia while it is frequently found in jaundiced individuals.

HISTOPATHOLOGY AND CHEMICAL ANALYSIS

Histopathological examination of the skin demonstrates the pigment to be in the upper layers of the epidermis and especially in the horny layer. It has also been found around the sebaceous glands. The skin does not show any other abnormalities.

The blood serum in carotinemia is yellow or orange colored while in jaundice it is brown or slightly green. To test for carotin—3 cubic centimeters of 95 per cent alcohol and a like amount of petroleum-ether are added to three cubic centimeters of blood serum and centrifuged. If the pigment is carotin it passes into the upper layer of the petroleum-ether, giving it a yellow color, while the bile pigments will remain in the alcohol. If a quantitative test is desired the upper layer may be poured off and compared with the bichromate standard.

In the past year I have observed three non-diabetic patients with carotinemia. A short resumé of their findings is of interest.

REPORT OF CASES

CASE 1.—A married woman, aged 28 years, had suffered for over a year with asthma and a severe, generalized allergic dermatitis. She had been placed on a diet rich in vegetables by her physician and frequently ate a raw carrot salad. She periodically exhibited a diffuse canary yellow color to the skin of the entire body. The sclera were always clear. Physical examination and laboratory findings were all within normal limits except for the presence of an orange colored pigment in the blood serum that was entirely extracted by petroleum-ether.

* * *

CASE 2.—A woman 48 years of age was on a voluntary vegetable and fruit diet for an ill-defined gastric complaint. She had a canary yellow discoloration of the skin on the sides of her neck, over her forehead, and on her palms and soles of three months' duration. The sclera were of a normal color. She stated that her family physician had told her that the yellow color was due to gall bladder disease and that an operation might be necessary to correct it. The blood sugar content was 0.10 per cent. Petroleum-ether dissolved a yellow pigment that was present in the blood serum.

* * *

CASE 3.—A woman 38 years of age in apparent good health, ate many vegetables because she liked them. She was particularly fond of carrots and spinach. Her palms and soles had been of a yellowish brown color for the past two years. The coloring on the palms was a source of considerable embarrassment to the patient. Routine physical examination did not reveal any abnormalities. The sclera were clear. Bile pigment could not be demonstrated in the urine. The yellowish pigment in the blood serum was extracted by petroleum-ether. The blood sugar was 0.085 per cent.

COMMENT

The first patient in this report with a severe generalized, allergic dermatitis, developed a yel-

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* Read before the Dermatology and Syphilology Section of the California Medical Association, at the Fifty-ninth Annual Session, Del Monte, April 28-May 1, 1930.

low discoloration of the skin of the entire body while eating raw carrots and other vegetables. The second patient, with an ill-defined gastric complaint, was diagnosed as having gall bladder disease because the yellow color of her skin was thought to be due to bile pigments. The third patient sought medical care because of the embarrassment of the dirty, yellow color of her palms.

Carotinemia has been observed more frequently in diabetic patients than in non-diabetic individuals. Some observers believe that its presence in a diabetic suggests an unfavorable prognosis. It probably is due, however, to a diet rich in vegetables and is not of metabolic importance. Nevertheless, diabetes should be suspected in all patients with carotinemia.

Carotinemia is of little clinical significance when the diagnosis is definitely established. The presence of clear sclera and the absence of bile pigments in the urine will exclude jaundice. The peculiar yellow color to the skin, a diet rich in vegetables, and an orange colored pigment in the blood serum that is dissolved by petroleum-ether will make a diagnosis of carotinemia.

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DISCUSSION

George F. Koetter, M. D. (812 Medical Office Building, Los Angeles).—Carotinemia and many other pigmentary disturbances of the skin are of interest to the dermatologist. Where syphilis of the liver and spleen accompany carotinemia, the differential diagnosis offers an added problem. Mild, periodic jaundice is suggestive of syphilitic hepatitis and a slowly increasing jaundice may originate from a malignancy. A thorough history with special emphasis on diet is of importance in establishing a diagnosis of carotinemia. Carotinemia presents an interesting diagnostic problem to the internist and dermatologist.

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C. Ray Lounsberry, M. D. (1111 Medico-Dental Building, San Diego).—Doctor Miller has ably presented the subject of carotinemia to us. I was especially interested because I recall a series of two cases which present the same clinical pictures.

The first case was that of a man who lived practically for thirty days on oranges, combined with raw vegetables. In the list of vegetables prescribed by his family physician were carrots. Practically every day he would eat an immense carrot salad. Oftentimes he would not only drink several glasses of orange juice a day but would eat two or three oranges, peels and all. According to his history, on the fifteenth day of that orange fast, he noted a peculiar yellowish discoloration appearing on his fingers and toes, which spread later to his palms and soles, finally extending up his arms and legs. He complained of no other symptoms except the peculiar disfiguring yellowish discoloration which seemed to be in the superficial layers of the epidermis.

The other case was a diabetic who had been placed upon a vegetable diet. Cooked carrots was his favorite dish. He presented a very mild case of nasolabial discoloration only. Clinical picture showed carotin which was light yellowish in color. Jaundice has been ruled out by means of the classical differentiation. I often wonder whether or not there is any relationship existing between the destruction of the pancreatic islands in the pancreas which is found in both diabetes and carotinemia.

DESTRUCTIVE "CALCULUS DISEASE"*

By Franklin Farman, M. D.
Los Angeles

Discussion *by Henry A. R. Kreutzmann, M. D., San Francisco; W. B. Dakin, M. D., Los Angeles; William E. Stevens, M. D., San Francisco.*

THESE observations are based on a comparative study of thirty selected cases of nephrolithiasis. They have been classified and grouped according to the type of condition presented and are based mainly upon the location of the calculi and the associated pathology.

GROUPING USED IN THIS STUDY*

Group 1.—This includes ten patients with uncomplicated nephrolithiasis each with a single calculus found lodged in the kidney pelvis or calices. The average age was 42.4 years. By sex, there were six females, described as fat—phlegmatic; and four males, described as muscular—vigorous.

Group 2.—This includes ten patients with nephrolithiasis complicated by such conditions as pyonephrosis, pyelonephritis, marked hydronephrosis, etc. The average age was 48.3 years, and included eight females and two males. For the most part the patients in this group were described as frail, thin, nervous, probably the result of long-standing, wasting illness.

Group 3.—This includes ten patients with ureteral calculi which, though perhaps a separate subject in itself, is of great value in a comparative way when considering "calculus disease." As was to be expected, here a lower average age was found, 36.8 years; the condition occurred equally as often in males as in females; and the types were those often referred to as muscular—vigorous.

COMMENT ON SYMPTOMS AND SIGNS

As a rule the pain or renal colic and the tenderness were found on the side affected; either in the right or left renal area and down along the

* Read before the Urology Section of the California Medical Association at the fifty-eighth annual session, May 6-9, 1929.

corresponding ureter. Though the kidney at times was palpable on the involved side, we did not often consider it enlarged in cases of uncomplicated renal or ureteral calculi. However, many times muscle spasm prevented satisfactory kidney palpation. In complicated nephrolithiasis, a definite kidney enlargement or mass formation was found in seven out of ten patients.

It was noted that there was a greater degree of bladder inflammation in complicated calculus disease, very little cystitis as a rule in uncomplicated nephrolithiasis, and usually a moderate degree associated with ureteral calculi. The ureter was totally obstructed or blocked nine out of ten times in the ureteral group, only once in the kidney pelvic group, and three out of ten times in advanced "calculus disease."

It was not possible to obtain reliable pyelograms or ureterograms in cases of ureteral calculi, due to blockage of the lumen and back flow of the opaque media. In the other cases of the series, satisfactory pyelograms were obtained showing usually some degree of hydronephrotic dilatation when a solitary stone was present, and marked hydronephrosis, pyonephrosis or kidney destruction in cases of advanced nephrolithiasis. The plain roentgenograms were positive except in one case of ureteral calculus, or in 93.4 per cent of the cases studied.

The number of pus cells and red blood corpuscles found upon urinalysis gives, in a relative way, an index of the activity of the "calculus disease" process. Upon the basis of four plus (++++), the lesser number of leukocytes was found in the ureteral calculi group, about two plus (++) in uncomplicated kidney calculi, and a large amount (++++) in complicated or advanced nephrolithiasis. As regards blood cells, it was noticed that hematuria occurred equally as frequently in cases of ureteral as in cases of kidney pelvic calculi, and rarely in cases of advanced "calculus disease."

Bacterial infection of the urine is frequent in complicated nephrolithiasis, and in this group of ten cases the B. coli was cultured six times and the staphylococcus twice. The urine was infected in only two instances of early kidney calculus, and in none of the ureteral calculi group, although cultures were reported in only three cases of the last group.

It was found that the kidney function was decreased about one-half on the affected side in cases of uncomplicated renal calculi. The average phenolsulphonephthalein output in a fifteen-minute interval was 5.1 per cent from the involved kidney and 12.1 per cent from the noninvolved kidney.

In the advanced group of "calculus disease" cases the function of the affected kidney was practically nil. Using the same phthalein technique, an average dye output of 1.4 per cent was obtained from the damaged kidney, and 16.4 per cent from the good kidney. The kidney-function comparisons of the ureteral calculi group are not given.

A study of the blood picture showed a normal red blood count and hemoglobin estimation in uncomplicated nephrolithiasis with a variable slightly increased leukocyte count during acute renal colic attacks. In the cases of advanced "calculus disease" there invariably was present secondary anemia and a persistent leukocytosis averaging 13,500.

The duration of symptoms, referable to the urinary tract, varied in the entire group from a few weeks to ten years or more. The symptoms occurred early in cases of ureteral calculi, were present on the average of one year in uncomplicated renal calculi, and from one to ten years in advanced nephrolithiasis. This goes to show that small migratory ureteral calculi produce characteristic symptoms early, that the symptoms of renal pelvic stone may be insidious and slow, and that the complications of nephrolithiasis show extreme chronicity, and often a silent metamorphosis.

TREATMENT

In the first group pyelotomy for stone was carried out six times,[1] pyelonephrotomy one time. nephrotomy once, and in the two remaining cases operation was refused by one, and in the other surgery was deemed inadvisable.

In the second group of complicated nephrolithiasis, primary nephrectomy was performed three times, secondary nephrectomy in three instances[2] (following previous nephrotomy or pyelotomy), nephropyelotomy twice, complete nephroureterectomy in one patient in whom two stones were lodged at the vesical juncture, and in the one remaining patient[3] operation was refused because of fear induced by a previous surgical failure.

In the ureteral calculi group the open operation of ureterotomy was performed three times, and in the seven other cases cystoscopic manipulations with ureteral dilatations were required on an average of two times before the stone was passed.

PROGNOSIS

In this group of twenty surgical operations for kidney calculi, the mortality was 5 per cent, the one death resulting from renal insufficiency following nephrectomy in a woman sixty years of age.

Of necessity the prognosis must be guarded in the surgical treatment of advanced nephrolithiasis because in this group one is dealing with the serious complications of pyonephrosis, pyelonephritis, large and infected hydronephrosis, perirenalitis, and oftentimes other remote pathology. Likewise the added risk of advanced age, secondary anemia, and malnutrition must be considered.

No deaths or surgical complications occurred in the group of operations for pelvic or ureteral calculi.

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[1] Includes one case operated by Dr. K. C. Gummes.

[2] Includes one case operated by Dr. T. O. Boyd.

[3] Case of Dr. T. S. Carey, showing renal calculus formation following spinal cord injury.

I consider the surgical treatment of uncomplicated kidney and upper ureteral calculi safe, sane, and advisable early.

As regards calculi in the lower ureter, a proper interval should be allowed for the voluntary passage of the stone, aided by suitable ureteral instrumentation, but when it appears likely that this will not be accomplished, then at an early date one of the open operations for calculus in the lower ureter should be performed.

1401 South Hope Street.

DISCUSSION

HENRY A. R. KREUTZMANN, M. D. (2000 Van Ness Avenue, San Francisco).—Doctor Farman has given a very interesting survey of calculi in the urinary tract. A mortality of 5 per cent is very low where operations on pyonephrotic kidneys are included in this series.

Nephrotomy *per se* is a serious operation. It is greatly complicated when dealing with a pyonephrotic kidney or an associated pyelitis. Because of this infection, a secondary hemorrhage is more likely to occur. Whenever possible the calculi should be removed through a pyelotomy incision. Where the kidney pelvis is intrarenal and not hydronephrotic, there is no choice and a nephrotomy must be performed.

The question of drainage of the kidney pelvis through the nephrotomy wound with a small rubber catheter is still not settled. Some urologists advocate this method, whereas others say it increases the possibility of a secondary hemorrhage.

It is always advisable, where either ureteral or renal stone is associated with infection, to reduce the infection to a minimum by renal lavages and the use of an inlying ureteral catheter before operation.

Doctor Farman is correct in not waiting too long for a ureteral stone to pass into the bladder. It is a difficult matter to say just when to operate. If the calculus does not move, if a beginning hydro-ureter and hydronephrosis is detected, or a pyelitis sets in, one should not hesitate to operate. If, however, the stone gradually moves toward the bladder we can afford to wait for some time.

❋

WIRT B. DAKIN, M. D. (756 South Broadway, Los Angeles).—It seems to me, after careful study of these cases, that in arriving at a conclusion it is best not to take any chance; the best action taken is no action at all. I have in mind a patient about three and one-half years ago in whom there were violent bladder symptoms. A large stone and enlarged prostate were also present. There was a stone in the kidney, and after carefully checking that two or three times, waiting one-half hour for 'phthalein to come through, we found that what return we did get was more from the kidney that had the stone than from the other one that was supposed to be better. Doctor Scholl was in the hospital that morning and I asked him to see the patient. He told me to leave the kidney stone alone, and the man is still alive.

❋

WILLIAM E. STEVENS, M. D. (870 Market Street, San Francisco).—Doctor Farman is to be congratulated on the excellent results obtained in his interesting series of cases.

As in prostatic hypertrophy, preoperative and postoperative treatment is important when surgical removal of renal and ureteral calculi is required. The kidney infection should receive appropriate treatment before, and, if necessary, after operation, and ureteral strictures should be dilated.

Pyelography is of value in the determination of the location, and occasionally of the presence and size of renal calculi. Of interest in this condition is a patient seen some time ago who had a stone apparently one centimeter in diameter in the left kidney. The coating of this calculus, following the injection of sodium iodid solution, however, showed it to be two and one-half centimeters in diameter. One of the most interesting cases of nephrolithiasis that has come under my observation was that of a man with an enormous coraliform calculus which filled the entire right kidney pelvis and the calices. The left kidney contained a small calculus the size of a pea. There was no pain in the right kidney and its function was better than that of the left.

It is sometimes possible to remove a kidney stone through an incision in the upper ureter in the presence of a pelvis which is entirely intrarenal.

Some time ago I operated on a young man suffering from bilateral giant ureteral calculi. The stone removed from the left ureter weighed forty-four grams. Three stones were removed from the right ureter several weeks later. The largest of these weighed eighteen grams. The literature contains no record of a similar case.

❋

DOCTOR FARMAN (Closing).—I wish to express my thanks for the discussion of my paper.

The point raised by Doctor Kreutzmann in regard to drainage of the kidney pelvis by the introduction of a small rubber catheter through the nephrotomy incision, in my experience has proved to be a good measure. It aids in preventing postoperative pyelonephritis. Urinary fistulae, following operations upon the kidney and upper ureter, are rare.

No doubt a certain number of recurrences of stone formation can be prevented through a careful plan of follow-up treatment to reduce urine infection, decomposition, and retention in any part of the urinary tract.

TRAUMATIC SHOCK—ITS NEWER ASPECTS AND TREATMENT*

By GEORGE K. RHODES, M. D.
AND
CAROL MCKENNEY, M. D.
San Francisco

DISCUSSION *by Ernest H. Falconer, M. D., San Francisco; Burns Chaffee, M. D., Long Beach; Charles T. Sturgeon, M. D., Los Angeles.*

THE term "traumatic shock" is often loosely applied to any of the several collapse states which may follow an injury. These group themselves roughly into three divisions: (1) Primary shock, which develops immediately following an injury and is a condition which is nearly always caused by hemorrhage or a nervous manifestation such as syncope. (2) Very late toxic states which are usually the result of sepsis in the wounded area, secondary to virulent infection such as gangrene. (3) Secondary or true traumatic shock, occurring after a definite but not extensive time interval and not caused by nervous collapse, hemorrhage, or infection.

It is the latter state with which this paper deals.

SECONDARY OR TRUE TRAUMATIC SHOCK

The subject of traumatic shock is still a very live one. In the course of our association with the San Francisco Emergency hospitals we have an exceptional opportunity to study this problem.

* From the Department of Surgery, University of California Medical School, San Francisco.

* Read before the General Surgery Section of the California Medical Association at its fifty-seventh annual session at Sacramento April 30 to May 2, 1928.

Traumatic shock is a general body state which is characterized by the following essential symptoms and signs:

1. There is a persistent reduced systolic and diastolic pressure associated with a rapid thready pulse and lowered pulse pressure.

2. The respirations are rapid and superficial.

3. The skin, which may be pallid, grayish, or cyanotic, is cold and moist with sweat.

4. Thirst is common, and nausea and vomiting are frequent.

5. The patient is often restless, but there is a lessened sensibility and a dulled mental state.

6. The temperature is usually subnormal.

7. Special laboratory tests reveal an increase in red blood cells and hemoglobin in the peripheral circulation. They[1] also show other evidence of decreased blood volume and volume flow.

When confronted with such a picture in a patient, it is essential to determine at once the presence or absence of acute hemorrhage as a superimposed factor. This differentiation is vital because gross hemorrhage usually demands hemostasis before the routine treatment of shock can be instituted safely.

If hemorrhage is the major factor, the clinical picture is altered in that: (1) The apathy is replaced by anxious alarm. (2) Instead of the passive immobility of shock there is restlessness and often a marked degree of muscular activity. (3) The shallow rapid respiration is replaced by deeper and more labored breathing, which is terminally aptly described as typical air hunger. (4) The examination of the peripheral blood shows a diminution in red blood cells and hemoglobin as in secondary anemia, thus differing markedly from the findings in shock. There is also a leukocytosis with a relatively high percentage of polymorphonuclear elements, and when the hemorrhage is internal there is a rapid and very marked increase in white blood cells. In patients suffering from ruptured spleen or liver, we have recorded a leukocytosis of 70,000 within one hour after injury. When the hemorrhage is secondary to intra-abdominal lesions, we usually have other associated evidences of an acute abdominal condition.

The constant derangement of physiological function in shock is one which affects the circulation and which brings about a lowered blood pressure and volume flow through loss of available blood volume from the vascular system.

PRINCIPLES UNDERLYING PROPER TREATMENT

To treat this condition of traumatic shock in a rational manner it is essential to understand the perverted physiological mechanism underlying the production of the pathological state. It may be assumed that the lowered arterial and pulse pressure, with the resultant diminution of blood volume flow, brings about a relative tissue anoxemia. This lowered blood pressure and accompanying tissue anoxemia are accountable for the other phenomena, such as lowered metabolic rate,[6] lowered blood alkali reserve (acidosis), and loss of body heat.[2 3 4 5] If the low blood pressure with its reduced volume flow is sufficiently persistent, permanent cellular changes are brought about in the higher nerve centers,[7 8] and these ultimately result in paralysis of the vasomotor center.[9] Herein lies the great need for early treatment in shock, for once the vasomotor center has become permanently damaged by the anoxemia, vascular tone is lost. When this loss of vascular tone exists, our efforts to combat shock, particularly those endeavoring to restore fluids, will be fruitless. The problem accordingly resolves itself into an attempt to interrupt the chain of events which leads to these typical vicious circle reactions.

Satisfactory explanation of the low arterial pressure is difficult. It is here that the theoretical accounts of the initiating factor in shock widely diverge. To consider them it is necessary to review briefly the possible factors which may bring about low blood pressure. There are: (1) Weakness and failure in the pumping apparatus, the heart. (2) Increase in the size of the vascular bed, partially at least under control of the vasomotor center. (3) Loss of blood volume with associated increased viscosity of the blood.

The cardiac factor can be dismissed at once, as no evidence that the myocardium plays any part in the circulatory failure of shock has ever been adduced.[10 11 12]

The theories depending upon vasomotor paralysis with its resultant stagnation of blood in the peripheral and splanchnic areas, though long popular, are untenable in the light of recent clinical[13] and experimental evidence.[14 15] This tone is diminished or lost only after the vasomotor center has been damaged by the anoxemia to which it has been subjected. The acidosis known to be present in shock states, also has been put forward as a cause of shock. However, the acidosis can be demonstrated to follow the lowered blood pressure rather than precede it.[2 3] The anoxemia attendant upon this diminished blood flow is in all probability the cause of the acidosis rather than the result of it.[4 5 18]

The above observations leave us with the third, or blood volume reduction factor, as the sole remaining possibility. That an actual and important loss of volume in the circulating blood does in fact occur, and this probably from hyperpermeable capillaries, is forcibly shown by the work of W. B. Cannon of the World War shock commission.[1 17] In that investigation blood volume was computed by the dye and dilution methods in all stages of shock and was invariably found to be markedly below the normal figures. That this loss of volume is at the expense of the fluid portion of the blood was demonstrated by hematocrit, red blood cell, and hemoglobin readings, which showed a definite concentration of the cellular elements in the peripheral or capillary

circulation. That these changes are not so marked in blood obtained by venipuncture strongly suggests the capillary bed as the probable site of the volume loss. That the loss is of the plasma and not the water portion, is shown by the failure of the protein content in the capillary blood to increase, which it would were only water to pass from the vascular system into the tissues.[18]

The relative increase of the cellular elements augments the viscosity of the blood, which further reduced the flow.

What causes this transudation of plasma from the blood into the tissues? War data have disclosed that men with severe wounds do very much better if the injured, often crushed, member is amputated before the onset of shock. There are other observations of a like nature which indicate the wounded area as the location of the factor which initiates the systemic reaction of shock. There are but two pathways by which such an effect could travel from the focal lesion, namely, the nervous and the vascular. Some simple but illuminating work by Cannon answers this question. In a series of well-controlled experiments,[9 19 20] he induced the typical clinical and laboratory pictures of traumatic shock in animals by crushing the thigh muscles. He made a continuous graph of the blood flow and pressure before and during the experiment. The following illuminating facts bearing on the therapy for the condition were noted: The blood determinations showed a distinct diminution in volume and flow and an increase in hemoglobin and red blood cells in peripheral circulation. That these effects were not the result of nerve reaction from the traumatized leg was demonstrated by sectioning all nerve communications to the part. This procedure did not alter the results in any respect. When the vessels from the part were clamped, no shock resulted. Clamping the vessels after the induction of shock resulted in a cessation of the blood pressure fall and in recovery in many cases. Reopening the circulation to the crushed tissues resulted at once in an exacerbation of the shock signs and eventually death. Massage of the injured tissues or active motion of the fractured member abruptly aggravated the shock status. Crossed circulation experiments gave identical results in an entirely uninjured animal, without producing shock in the injured. The conclusion must be drawn that there is a toxic substance disseminated from the traumatized tissues via the blood stream which has the ability to produce that clinical picture we choose to term "traumatic shock."

Above have been briefly outlined the various contributing elements which enter into the composite entity. The nature of the toxin is not entirely clear although the evidence at hand would indicate that the state is the result of a proteose intoxication. It is known, for example, that proteoses are released from traumatized tissues.[19] It is also apparently proved that proteoses and histamin bodies will produce all the conditions seen in shock.[21 22 23] The inference that the toxin is produced by proteolytic activity is strongly suggested. Possibly substances given off by extravasated blood are likewise depressive to circulation, as blood injected just prior to coagulation does drop blood pressure. There are other clinical entities such as gas gangrene, high intestinal obstructions, extensive burns, and severe local sepsis which bring about a pathologic state identical with traumatic shock. In each of these conditions the etiologic factor is quite generally accepted as being the result of a toxic proteose absorption.

ACCESSORY AND AGGRAVATING FACTORS

Though a toxin derived from traumatized tissues is the fundamental feature in the initiation of shock, it seldom works alone to produce this state. Usually one or more specific aggravating factors are present to augment or prolong the toxic effect. Particularly does hemorrhage before and during shock jeopardize the patient's chances for recovery. There is a point in the falling blood pressure which represents a critical level, beyond which anoxemia, acidosis, and other evidences of shock make their appearance.

In uncomplicated shock this level is a systolic arterial pressure of about 70 to 80 millimeters of mercury. When, however, the patient has suffered hemorrhage, even in amounts which alone would be totally unproductive of symptoms, the shock state is greatly aggravated so that the critical level of the blood pressure should be raised ten or more millimeters of mercury. Exposure to cold markedly endangers the patient's prospects by inaugurating a vicious circle in which the slowed circulation has already caused a drop in body heat.

The question of surgical anesthesia comes into prominence as a possible augmenting agent in shock. Ether is known to have a depressive action on the myocardium, thus introducing a cardiac element into an already embarrassed circulation. Properly proportioned and administered nitrous oxid and oxygen or local anesthesia obviates this danger. Other complicating factors are vomiting and sweating, both of which increase the fluid loss. Chest wounds with resultant impairment of respiration, jolting or motion between bony fragments which may occur in transportation, also increase the shock. Undoubtedly psychic and nervous manifestations may aggravate the approaching collapse of the circulatory system.

PROPHYLAXIS AND TREATMENT OF SHOCK

To be effective, the treatment and prophylaxis of traumatic shock must be predicated upon the facts above noted. It must always be before us that the early application of even the simplest remedial measures is of fundamental importance. The various vicious circles which tend to establish themselves suggest certain procedures at once.

A. *Control of Hemorrhage.*—This must be done promptly and adequately, for it has been proved that individuals who have been severely

injured are often reduced to the state of shock by even a slight hemorrhage. The use of a tourniquet alone for the control of hemorrhage is to be condemned when simpler means, such as packing, pressure, or ligation, will suffice. The release of a tourniquet, long applied, is often attended by disastrous results to both the extremity and the injured individual. The tourniquet, therefore, should be reserved only for short temporary application, as during an operative procedure. (Note: The tourniquet has its ideal usage when it limits the absorption of toxic material from an extremity. In these instances when the extremity must obviously be sacrificed on account of trauma, gangrene, or sepsis, the amputation is performed proximal to the permanently placed tourniquet.)

B. *Conservation and Restoration of Body Heat.*—The association between the incidence of shock and loss of body heat has been well established. The conservation and restoration of body heat alone has frequently been efficacious in turning the tide in the patient's favor. The injured man should be surrounded immediately by dry clothing, warm blankets, and hot water bags, and during the preliminary examinations there should be the very minimum exposure of the body. When possible, hot drinks are an effective mode of contributing heat to the injured.

C. *Pain, Restlessness, and Psychic Disturbances.*—These should be controlled early by the liberal administration of opiates together with properly applied surgical dressings and psychology in the nature of reassurance.

D. *Posture.*—The elevation of the foot of the bed with so-called "shock blocks" is still a routine procedure although the rationale has been questioned.[24,25] Undoubtedly, in primary shock or syncope it is a most valuable measure.

E. *Medication.*—Symptomatic treatment is directed principally toward restoring the low blood pressure to a normal level. Vasoconstrictors, such as ephedrin, adrenalin, and pituitrin, are probably of slight value because, though they may increase the blood pressure temporarily, they fail to increase the blood volume and may, in fact, decrease it further by constricting the capillary bed. Caffein in large doses is used almost routinely as the proper stimulant for the patient in the shock state. Certain observers recommend also various cardiac stimulants of the digitalis group for these patients. The value of both caffein and digitalis is probably overestimated, as apparently there is no intrinsic myocardial fault demonstrable.

F. *Administration of Fluids.*—The effort to raise the blood pressure by forcing fluids is a more rational procedure, as these fluids act in some measure as a substitute for the lost blood plasma. The effect is transitory, however, as the added fluid quickly leaves the vascular channels through the damaged and permeable capillaries; but, though transitory, the benefit is none the less actual and often will serve to tide the patient over a critical point. When possible, the administration of fluid by mouth and rectum is simplest and most efficacious. The intravenous or subcutaneous routes, however, are always available. Lately intravenous glucose, the metabolism of which is assured by insulin, has become deservedly popular, as not only is volume thus furnished, but the cellular nourishment so greatly needed in many of these patients is provided. Particularly is this true of those patients suffering from shock in whom the pancreas temporarily seems to have ceased functioning. Blood transfusion is undoubtedly the best procedure of this nature, as the plasma so supplied, being colloidal in nature, is not so readily lost into the tissues as the more diffusible crystalloid solutions. In the opinion of most recent authors, gum acacia solutions are too dangerous to permit their use.

There is but one way to attack the fundamental cause of the shock state. The dissemination of the shock-producing toxins from the injured tissues must be prevented or limited as completely as possible. Cannon's experiments with injured extremities of animals have a practical application which should standardize the treatment of hopelessly mangled human extremities.

SUMMARY

Accordingly, for the San Francisco Emergency Hospital service, we have endeavored to formulate a rational method of treatment for seriously injured extremities. We have combined the aforementioned routine symptomatic therapy with adequate modern surgical treatment as outlined below:

1. For the simpler comminuted fractures and for other less severe injuries, adequate splinting will suffice.

2. For the badly compounded fractures or severely lacerated extremities, thorough debridement under nitrous oxid-oxygen anesthesia, with immediate institution of Carrel-Dakin therapy, is indicated.

3. For the hopelessly mangled extremity which obviously is ultimately to be sacrificed, even more radical measures are adopted. In these cases a tourniquet is carefully and permanently applied just proximal to the traumatized tissues. The patient is then treated for traumatic shock by the various measures outlined, and the blood pressure and general status carefully watched. The patient's blood pressure must be at least 80 to 90 millimeters of mercury before we consider amputation safe or advisable. The time interval required to reach this minimum systolic pressure bears a direct relation to the adequacy of the routine shock treatment applied. It also bears a direct relation to the period which has elapsed before the application of the permanent tourniquet. The time required to prepare the patients in our series varied from two to twenty-four hours. Extended periods of time must be avoided at all hazards, for the disintegrating tissues distal to the tourniquet encourage sepsis which may rapidly surmount the tourniquet itself in cases of gas gangrene caused by *B. welchii* or similar organisms.

We are convinced that every patient who has extensive severely traumatized wounds routinely should receive immediately prophylactic inoculations of both tetanus and anaërobic sera. The polyvalent serum developed from the saccharolytic and proleolytic anaërobic cultures has proved highly satisfactory both as a prophylactic and as a therapeutic agent.

The amputation is usually of the guillotine type, rapidly performed just proximal to the tourniquet, which is left in place throughout the operation. This is most important. Indeed, this tourniquet is at no time disturbed after its original application. We have repeatedly verified clinical data, showing that even temporary release of such a tourniquet which has been long applied often results in rapid and fatal relapse into the shock state.

Results in the treatment of hopelessly mangled extremities by the outlined procedures have been most gratifying to us in a considerable number of cases. We have observed many instances of dramatic recoveries of patients who seemed almost moribund, and for whom even bilateral amputations done in accordance with the described technique were successful.

These procedures are submitted as a guide for the rational treatment of patients suffering from traumatic shock. For those with hopelessly mangled extremities, they offer a very practical mode of treatment.

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DISCUSSION

ERNEST H. FALCONER, M. D. (384 Post Street, San Francisco).—This is an excellent résumé of the present status of shock because it deals with the physiology of the condition. Once the underlying factors in the production of shock are understood it becomes readily amenable to treatment if the simple measures mentioned by Doctors Rhodes and McKenney are promptly carried out. It is worth while emphasizing again the fact that if the vasomotor center in the brain is deprived for more than one hour of an adequate blood supply and, of course, oxygen supply, which is the important thing, it becomes nearly a hopeless task to bring an individual out of the shock state. The reason being that the vasomotor center suffers permanent damage rapidly when its blood supply is cut off by the extremely low blood pressure and poor circulation of the shock state. It is extremely important, therefore, to watch the blood pressure. When critical blood pressures are present never operate on a patient under ether anesthesia. The simpler resuscitation measures as external heat, fluids intravenously, hot drinks, morphin in large doses (one-half grain), will often serve to restore the pressure. If it continues to drop below the critical point, prompt recourse to blood transfusion is indicated. The discusser used gum-salt solution extensively in shock and resuscitation work during the World War and never noted any untoward results, but apparently this has not been the general experience.

BURNS CHAFFEE, M. D. (917-21 Security Building, Long Beach).—The essayists have presented a very practical paper on an ever-important subject—automobile accidents alone furnish too many cases of traumatic shock. As has been stated, shock may be caused experimentally by one of several conditions; however, in man shock is generally the result of several factors. I do not believe that you can exclude nervous collapse or absorption of toxic substances, nor entirely rule out hemorrhage in every case. If hemorrhage is the primary factor, blood transfusions bring about a rapid recovery. Not infrequently the leukocyte count may be twenty thousand or even higher and in some cases of moderate shock in which no hemorrhage exists, and in the absence of crushed tissue; the increased count is probably due to absorptions of toxins resulting from more or less trauma to the entire body. Evidence at hand proves beyond a doubt that surgical shock is essentially due to intoxication by materials derived from damaged tissues and no doubt there is a difference in individuals' ability to tolerate the toxic substances whether they be proteoses or histamine bodies. This may explain why certain individuals are more susceptible to traumatic shock than others.

CHARLES T. STURGEON, M. D. (1930 Wilshire Boulevard, Los Angeles).—Whatever the absolute cause of shock may be, the end result is deoxygenation of the body tissues which results from diminution of blood volume in circulation. The loss is due to stagnation of the blood in the capillaries. Hemorrhage and low blood pressure are frequent factors. The rationale of the treatment, therefore, is to restore the volume in circulation and to raise the blood pressure.

Blood transfusions are superior to any other form of treatment in restoring the blood volume whether hemorrhage is or is not a factor in the production of the shock. Next in value is a glucose solution—10 per cent glucose in 1000 cubic centimeters of salt solution plus insulin. Next in value is salt solution, and although salt solution is the least valuable of the three mentioned, still it is always procurable and easily prepared. If for some reason it is impossible to give a blood transfusion or glucose at once, the salt solution should be given.

The method of administration should be the intravenous route. If the solutions are well prepared and given slowly, there is no danger of any heart com-

plications or severe reactions. The subcutaneous and rectal method are too slow and indefinite when dealing with a very sick patient.

To raise the blood pressure the best thing we have found has been the use of ephedrin sulphate. In some cases where the pressure has been extremely low we have not hesitated to use it intravenously, and repeated it as often as necessary because it is definitely known that patients with a low blood pressure of 80 or less which has existed for more than four or five hours rarely recover.

If when surgery is necessary, such as an amputation, etc., the question arises what type of anesthetic is best to use. Spinal anesthetic does wonderfully well for this type of patient although it has a tendency to depress the blood pressure slightly. If ephedrin sulphate has been used just before the anesthetic and given during the operation if the blood pressure drops perceptibly, the operation can be performed without any risk to the patient. I think spinal is an ideal anesthetic.

The more we understand the pathology of shock the clearer our line of treatment will be.

THE PSYCHONEUROTIC PATIENT AND THE CLINICIAN*

By WILLIAM H. BARROW, M. D.
San Diego

DISCUSSION *by Arthur L. Bloomfield, M. D., San Francisco; V. R. Mason, M. D., Los Angeles; C. M. Haviland, M. D., San Diego.*

PATIENTS are of two types, one group presenting symptoms which are clear-cut and apt to be minimized; the other group with complaints which seem to spread out like the waves on a pool of water into which a rock has been thrown and where though the primary disturbance is really slight the turmoil of the waters is great.

It is inevitable that, under the stress and strain of our modern social and industrial existence, the psychoneuroses and neurasthenias should loom large as clinical entities and as outstanding factors in other diseased conditions. Review of medical literature indicates that there has of late been a reawakening of interest which comes as a reaction against a practice of medicine that here and there was becoming too cold-bloodedly scientific; a system where in the maze of scientific data it was possible to forget that the patient was a sentient human being who had a soul as well as a body, and that the reactions of the one were as important as the reactions of the other. Carrying on the discussion where it was left off in the literature by Weir Mitchell and Osler many years ago, there is of more recent date an outstanding monograph by the late Francis Peabody.[1] He pointed out that in order to treat a case of any sort intelligently and adequately the doctor must know the patient through and through; that disease in man is never the same as disease in an experimental animal; that its manifestations are different even in different individuals, and that disease "at once affects and is affected by . . . emotional life." In a symposium at a recent meeting at the American Medical Association, Woodyatt, Hunt, Foster McLester, Neilson, White, Einhorn, Kilgore, and Rosenow[2] discussed the interrelation of somatic and psychic disturbances and emphasized the fact that disease, be it functional or organic, must be studied and treated with both physical and psychic factors in mind. There is hardly a medical convention today without one or more papers on the functional or so called affective disorders.

In all of this discussion emphasis has been laid on etiology and diagnosis rather than on treatment. The purpose of this paper is to approach the problem from the point of view of the management of these cases insofar as such management falls within the realm of the clinician and general practitioner.

THE PSYCHIATRIST AND THE GENERAL PHYSICIAN

In this day of specialization it might at first seem most expedient to refer these cases to the psychiatrist, but such a disposition is not generally satisfactory. The neurasthenic patient seldom consults his doctor for nervousness or mental symptoms, but rather for indigestion or headache or palpitation of the heart or for any one of a number of other physical ailments, and he resents being told that his trouble is all "nerves" and objects to being sent to a man who treats only "nerves." A patient who had had severe headaches all her life recently told me that she had been referred to a psychiatrist because there was nothing organically wrong with her and that this psychiatrist had psycho-analyzed her and told her that she was a Peter Pan type of individual, that she would have been all right if she could have remained a child, and that it was a mistake for her to have assumed the strain and obligations of married life and motherhood. "Well," she said in a tired way, "That may all be true, but what am I going to do about it now, and—I still have my headache." The patient comes to us not only for a diagnosis but for treatment of his symptoms, and where these symptoms are related to functional or organic physical disorders more can usually be accomplished by the patient's own physician than by the psychiatrist alone. Psychoneurosis is, of course, to be differentiated from true psychosis, pure hysteria, anxiety neurosis, and the other purely psychic disturbances which fall distinctly within the realm of the psychiatrist.

SCOPE OF THIS DISCUSSION

This discussion is limited to that large class of cases included of late under the broad term of psychoneurosis, in the past more commonly called neurasthenia; a condition where the chief complaint is usually physical, where the subjective symptoms are usually out of all proportion to the physical findings, and where there is always an underlying and usually obscure mental or psychic disorder, based on some environmental or circumstantial conflict.

It would seem that in these cases the somatic manifestations are due to organic or functional disorders, the symptoms of which are exaggerated by the lowering of the patient's threshold

* Read before the eighteenth semiannual meeting of the Southern California Medical Association, April 5, 1929.

to pain and discomfort. I realize that this statement is open to argument, but I cannot, within the scope of this paper, do more than express this personal opinion—that where there is a physical complaint there is an underlying physical defect that needs attention. The patient who is having indefinite but perfectly real abdominal distress may rightly be much dissatisfied with the medical opinion that, because the gastro-intestinal series and other investigations are negative, there is nothing wrong with him. Incidentally, these somatic complaints offer an opportunity to the physician to give the patient relief and thereby win his confidence and trust much more quickly than psychotherapy alone could do.

SIGNS AND SYMPTOMS OF PSYCHONEUROTICS

As has been brought out in the literature, the manifestations of psychoneurosis are legion. In a series of cases which I recently studied, the complaints referable to the gastro-intestinal tract outnumbered all other complaints combined. General fatiguability was second, and symptoms referable to the nose and throat or respiratory system were third. Headache was seldom the outstanding symptom, but was, nevertheless, found to be present in more than half of the patients. There were present also some of the lesser complaints of nervous irritability, inability to concentrate, capricious appetite, fitful sleep, palpitation of the heart, precordial pain, inability to get a full breath, and loss of libido, or other sexual disturbances.

DIAGNOSIS

In the diagnosis and management of these somatic disorders I can here take up only one or two points, since a full discussion would cover most of the functional disorders of the body. In taking the history it is often helpful to get the chief complaints without leading questions. This is of twofold value. In the first place it insures a truer picture because the psychoneurotic patient is so subject to suggestion that he will admit having nearly any symptom that is suggested to him. In the second place, there is often real therapeutic value in the relief of pent-up emotions and in the mental catharsis that takes place when the patient is encouraged to tell his whole story in his own way.

In psychoneurosis, diagnosis is obviously reached by elimination. It is essential to rule out all hidden disease and to understand the extent of such disorders as are apparent before one may safely say that the subjective symptoms are out of proportion to the disease and the psychoneurosis is an outstanding factor. We have all seen cases of pernicious anemia or deep-seated malignancy, or central nervous system lues, or of glandular dysfunction which have been undiagnosed and the patients have gone from doctor to doctor stigmatized as incurable psychoneurotics.

TREATMENT

In the treatment of the gastro-intestinal disorders, which are so commonly the outstanding complaint in the psychoneuroses, thorough investigation is essential and one should avoid the temptation of giving, in desperation, drugs merely for the sake of doing something. Placebos will work temporarily—they are part of the armamentarium of treatment by suggestion which has fallen into disrepute—but they are apt to make the patient a slave to bottles for the rest of his life as he tries first one thing and then another in an effort to get the relief he once got. I have done gastric analyses on many of these patients, and there is, so far as I have been able to determine, no disturbance of the gastric acidity or rate of secretion unless there is also an organic lesion to explain it. Disorders of motility and peristalsis, that is tonic or atonic states, are however, not uncommon, as was recently shown by Ruggles[3] in x-ray studies, so that although belladonna is often indicated, the alkalis so commonly given for nervous indigestion are not.

In the diagnosis and treatment of the underlying psychic disturbances it is helpful to bear in mind that there is usually, to begin with, a congenital constitutional nervous instability—a nervous system that was inadequate for the demands of life before ever the patient embarked on life's troubled waters. If the course of existence is a smooth one, all goes well enough, but in a storm, be it physical or mental, the ship does not handle well; weaknesses develop, and the ship founders. Easing the burden under which the patient labors obviously calls for an intimate knowledge of the patient's hereditary background and present status on the part of the physician, and faith and confidence in the doctor on the part of the patient. This much of our old medico-religious system of practice we have left—that without faith we are helpless and the patient is hopeless.

The circumstantial factor in a psychoneurosis may be toxic or traumatic or due to environmental conflicts; and here the psychiatrist can be of great help in analyzing the situation. Treatment may take the form of suggestion with the use of placebos or even of hypnotism, although this form of psychotherapy has been abandoned as being of little permanent value. Or we may use persuasion, which in my experience is ineffectual because it calls for constant application, which is hardly practical. Persuasion is a crutch on which the patient leans and without which he is again helpless. Finally, there is psycho-analysis, by which the patient is made to understand himself, recognize his limitations, to minimize his symptoms through a realization of their significance. In passing, it might be said that the will, the desire to get well, is a prerequisite of successful progress. The hopeless cases are those in which the psychoneurosis is an escapement or defensive manifestation, and where a life of invalidism is more desired than the battle of life with inadequate equipment. Many of our so-called shell-shocked veterans receiving compensation from the Government and sympathy from the relief organizations are in this hopeless class.

Where the psychoneurosis is completely disabling, the old Weir Mitchell [4] treatment is often most effective. It is sound in theory and efficient in its application. The patient is, after careful clinical study, put in an institution, preferably a quiet convalescent or nursing home. He is completely isolated from his old environment and an effort is made to start him off anew, physically and psychically. An efficient and sympathetic nurse is essential. Except for the visits of the doctor and the nurse he is completely shut off from the outside world. He is not even allowed to receive or to write letters. He is put to bed and placed on a semi-starvation diet. After a few days, if there is no serious gastro-intestinal disorder, the diet is rapidly increased and the patient's first new interest is perhaps in his food and in his increase in weight. Massage and hydrotherapy, which at first are sedative in character but later more vigorous, are part of the regimen, and the visit of the masseur comes as an added diversion and interest. Later, occupational therapy of some simple type is added to afford some physical activity and training in concentration. As the patient improves he is gradually allowed to extend his activities, to venture out for short walks, to again come in contact with the world. The rôle of the physician through all this is that of the master whose word is law but who, with encouragement stands ready to help the patient find himself, and by his professional skill to relieve the physical discomforts. These patients are usually of the intravert type and although some introspection is to be at first encouraged so that the individual may understand himself, treatment that is purely psychotherapeutic may defeat its own end. Likewise, treatment directed at any one organ alone is apt to center the patient's attention too much on that one part of his body and aggravate rather than alleviate the condition. What is needed in the attending physician is not a highly specialized knowledge of psychiatry or of any of the other specialties, but rather a breadth of medical vision and skill that will enable him to make the patient comfortable. The physician should have a large fund of patience and compassion and common sense so that he can establish contact with the patient and win his confidence and, finally, should have the ability to call for and profit through help from consulting specialists when such aid is indicated.

The unfortunate part of the Weir Mitchell regimen is that it is possible only for the well-to-do, but the basic principles may be used generally. For example, even a clinic patient can arrange for rest in the quiet of her room for a period each day; she can resort to the bathtub for modified hydrotherapy; she can get a taste of comparative isolation by visiting the home of some unmarried or childless friend once a week; she can test the value of occupational therapy by developing a hobby, and she can, of course, follow the required dietary regimen. If meanwhile the somatic complaints are adequately treated and the doctor takes the patient into his confidence and makes her understand the rationale of the procedure the results may be most encouraging.

CONCLUSIONS

1. The psychoneuroses are characterized by a combination of psychic and physical disorders, the one reacting on the other. Treatment must be directed at both the somatic and mental manifestations.

2. Where there is a physical complaint there is usually an underlying physical defect, the symptoms of which are exaggerated by the patient's lowered threshold to stimuli of pain or discomfort.

3. The common somatic complaints have been enumerated and some practical points in diagnosis and treatment discussed, with special reference to gastro-intestinal manifestations.

4. In the treatment of the underlying psychic disorder the patient should be made to understand himself and taught to compensate for his constitutional defect.

5. The details of the Weir Mitchell treatment are reviewed and a plea made for the more general use of the basic principles of this regimen in the ambulatory patients who pathetically come to us day after day seeking relief.

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DISCUSSION

ARTHUR L. BLOOMFIELD, M. D. (Stanford University Hospital, San Francisco).—Doctor Barrow's paper takes up a most important phase of medicine, namely, the border-line zone between internal medicine and psychiatry. Doctor Barrow emphasizes the important fact that whether or not gross lesions are demonstrable as a cause for the patient's symptoms, an element of functional maladjustment, in the broad sense, may often exist as well. Unless this element is considered and dealt with, no satisfactory result can be obtained. The importance of studying the patient carefully and becoming thoroughly acquainted with him as a complete individual, and the value of prolonged rest, upbuilding, encouragement and readjustment are properly emphasized. Many physicians think of these measures as quite obvious and simple in their application; as a matter of fact, the proper conduct of a rest cure so that substantial results are obtained is as highly technical a procedure as the removal of a gall bladder. Little of value has been added to the original Weir Mitchell method, and it is fortunate that physicians in these modern days when "quick results" are arrived at have, for the most part, neglected an invaluable mode of therapy.

V. R. Mason, M. D. (838 Pacific Mutual Building, Los Angeles).—Psychoneurosis is not a disease entity. It is a type of reaction of an individual to his environment. The causes of this abnormal reaction are numerous. In many instances the precipitating factor lies in the affective sphere; in other cases chronic somatic disease is present. In the greater number, I believe, the symptoms are manufactured as a wall of protection against life's struggles. It is apparent that rest cures and proper medical supervision will rehabilitate some. A large number might be cured by compulsion; a remedy which cannot be used in our modern civilization. Instead many have been able to keep up their pretense of sickness by daily visits to the physician for the application of the latest therapeutic fad.

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C. M. Haviland, M. D. (Medico-Dental Building, San Diego).—One of the main functions of an article such as that written by Dr. William H. Barrow on "The Psychoneurotic Patient and the Clinician" is to call the attention of the medical profession to the increasing necessity for a careful study of these patients in an effort to understand the causes for this rapidly growing class of emotionally sick (?) individuals.

As a result of working with these psychoneurotics one discovers that the emotional development of an individual is subject to as many pathological variations as is the physical make-up; in fact they exceed them, and it is in this department of medicine that there exists the greatest need for trained and enthusiastic workers. In life's journey from infancy to adulthood it is a common occurrence that some few strands which enter into the emotional sum-total of an adult individual have failed to develop properly while others have continued on to normality. The final outcome of this uneven emotional development is a curious combination of childishness and maturity—the psychoneurotic—hence the phobias, the inferiorities, the invalidisms, and so on. In the physical realm of growth the same process results in infantile residuals of organic development.

The psychoneuroses are like the organic diseases in that no one method of treatment is applicable to all cases and, as in the case of physical disease where the family and the early personal history of the patient is carefully examined, so in the neurotic an adequate study of the emotional history is a prerequisite to any outline as to treatment. To either affirm or deny that these neurotic states are always founded upon organic pathology would be slightly overreaching the present state of absolute knowledge on the subject. Insofar as the functions of the body come under emotional control we will find, in these neurotics, greater or less physical changes taking place as a result of the emotional interference which may by long continuance become chronic, eventuating in true organic disease.

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Doctor Barrow (Closing).—The discussion has emphasized the important point that the study and management of these cases calls for an expenditure of time and patience as well as a considerable degree of acumen in uncovering the prime factor in the disturbance. That many of us are unwilling to give so much of our time to one patient is the cause for the prosperity of the irregular cults to which so many of these patients finally go for relief. I am reminded of an incident where one of our great clinicians was seeing a case in consultation in a small town near Baltimore. One of the doctors with him whispered that if he hurried he could catch a certain train back to the city. The consultant immediately replied that they could afford to miss the train, but that above all things, they could not afford to be in a hurry. This is certainly the attitude that one must take in attempting to treat these rather obscure and always difficult cases.

THE LURE OF MEDICAL HISTORY

SIXTEENTH CENTURY GERMAN MEDICINE*

Artzneybuch of Hofmedicus Gäbelthouer

PART III

By S. L. Millard Rosenberg, Ph. D.
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AS we said at the beginning of Part II, before the reader lets his amazement run away with him while perusing these extracts from the sixteenth century *Artzneybuch,* let him look at the many evidences of like practices today. Should we be so cocksure of our own advancement? Is man not, even in this twentieth century, somewhat predisposed to forsake precise medical data, and jump from such to the spectacular methods of the Middle Ages? For instance, take the following item, which just now reaches us from Paris, where highly reputable physicians have revived the common practice of ancient times of mashing snakes' heads into medicine in the belief that "its former widespread use could not have rested solely on credulity and imagination." A rather naïve belief, it would seem, for according to such logic, and having at hand the *Artzneybuch,* may we not look forward to revivals of a goodly number of noxious and repellant medicaments? Let me quote from *The Journal of the American Medical Association* of July 19, 1930, page 212. The quotation is from the journal's regular Paris correspondent, and is headed "Attempt to Reintroduce the Viper as a Medicament." The item is as follows:

Ancient medicine made great use of a concoction of parts of vipers, which was used in many diseases and was described in the pharmacopeia as late as 1884, although long since completely abandoned. Professor Billard of Clermont-Ferrand took a notion recently, out of curiosity, to make a study of this product, thinking that its former widespread use could not have rested solely on credulity and imagination. The heads of vipers were placed for a month in a 95 per cent alcohol solution and then were ground up with chopped meat, and ten times their weight of physiologic sodium chloride solution was added. The product was then passed through a candle filter and put into ampules. This maceration, when injected into the peritoneum of rabbits, caused an abundant evacuation of urine, and in healthy human subjects, when injected subcutaneously, the same result was observed. The article of Mr. Billard and his assistant, Mr. Barbes, in the *Concours Médical,* contained an account of a young girl who it was feared would die of scarlet fever. As her kidneys no longer seemed to function, she was given two subcutaneous injections of the maceration, and it brought relief and the child recovered. The maceration was found to be a diuretic of great value, which is the same conclusion reached by the physicians of ancient times.

* Part I of this paper, giving the introductory comments on the book under review, was printed in the July issue of California and Western Medicine, page 508. To understand the prescriptions here given, it is desirable to read Part I of this paper. Part II was printed in the August issue, page 602. The book referred to is the "Artzneybuch" of Hofmedicus Gäbelthouer, printed at Tübingen, Germany, in 1596. Brackets as used in this article are insertions by the translator.

We do not quote this to ridicule it; not at all. Only to show that while doubtless much of the older medicine has been happily abandoned, it was not all fantastic.

One of the letters received from a member of the California Medical Association, in connection with what has just been said, may be quoted here:

"I read the 'Sixteenth Century German Medicine' article with interest. I think these historical articles are perfectly bully and that the young men in the profession can do no better than take interest in the history of medicine if for no other reason than to see that perhaps some of our present ideas will be proved to be just as absurd as some of these old ones were."

Bearing these possibilities in mind, let us proceed with the quotations from the *Artzneybuch*.

SIXTEENTH CENTURY REMEDIES FOR STOMACH AND BOWEL DISEASES

Stomach troubles:

"A spoonful of rose honey mixed with brandy, taken every morning, is excellent. Or, break a new-laid egg into a plate into which brandy has been poured. Burn it, and eat promptly after all the brandy is burned up, just before going to bed."

"Especially *when gall has entered the stomach,* vinegar on toasted bread is very helpful; this is also good as a bandage on stomach and heart, renewed frequently. Or, you may use a sponge soaked in boiling hot vinegar and squeezed fairly dry; apply hot and renew frequently."

"For *gas on the stomach,* grate horseradish fine, add a can of good old wine; drink a spoonful every hour. If gas causes *colic or severe griping,* take fresh almond oil, add equal quantities of brandy and camellia water, and a little sugar. Use regularly before meals. *For very severe colic,* secure half a dozen eyes of good-sized pickerel, an equal number from large crawfish; add several peelings of bitter orange; grind fine. Add a good strong wine. Give the patient a stiff drink of the mixture; see that he keeps very quiet and well covered and eats or drinks nothing for three or four hours. This will restore him."

"The meat of a pup not over nine days old is also excellent. It is helpful, too, to drink your wine or water through a large dried wolf's gut. Excellent also is a chest bandage filled with feathers of a hazel-hen, worn continuously. Or take cow droppings mixed with pigeon droppings in lard or other grease; heat and apply in a bandage over the navel. Or take the foot of a wolf and place on the navel. As it grows warm your pain will diminish. To salve your belly well with old grease and then place on it a little bag of ashes from oak wood, moistened in water or wine, is also very helpful."

Dysentery, or bloody flux:

"Take a new brick, heat it red-hot, pour red wine upon it; sit over it, permitting the steam to enter the anus. Take frequent hot foot baths, adding to the water boiled pigeon droppings. See that the water does not extend above the ankles. Take also living crawfish, put into a pot and burn to a coal; grind, and give a small portion of the powder night and morning in good red wine until relief comes. *If the trouble is due to worms,* boil in high-class goat's milk several garlics, and give an occasional hot drink of it. This will destroy the worms. *For either red or white dysentery*: skin an eel caught in May; mince the skin fine and dry; grind to powder. At every stool, pour a small quantity on the bowel-movement itself. Have the patient observe the greatest care and abstinence as to food and drink."

Tapeworm:

"Let the patient eat nothing whatever for three days. Then prepare a large potful of hot goat's milk. Put the patient on a bench with a privy-hole in it, and let the steam from the milk enter the anus. This will attract the worm. Seize it when it shows its head and pull it out."

"If a *worm attacks your heart,* cut up a large radish, mix with salt, and eat on an empty stomach. Your heart worm fears nothing so much as a radish."

"For *hemorrhoids,* burn dog excrement and powder it; pour some on the protruding gut. It will not come out so soon again. Also use a salve of white onion and butter; smear your posterior with that. And the juice of unripe sloeberries mixed with red wine will make a good wash for the posteriors."

"For *ulcerated piles,* take equal quantities of incense, mastic, and dog excrement, and a small portion of sulphur; mix, burn, and let the smoke come up to the anus. Some prefer myrrh to sulphur. Or take several snails, the kind that have no shells; put in a pot; stick with a knife or any pointed instrument to secure the frothy exudation, with which smear the piles, and a cure will be effected promptly. Such snails, with their froth, can be kept for a whole year, especially when well covered with salt. Or take a quantity of goose droppings—make sure that they are of geese only; cover well in a glazed pot, sealing with lime if necessary; heat until incinerated, and cool. Dip some cotton in hot olive oil; add about a walnutshellful of the goose powder, and keep this tampon on for about an hour. Repeat until cured."

"Goose droppings are excellent also for *costiveness,* a small quantity in hot pea soup, adding condiments enough to make it palatable. Mouse droppings are equally effective, treated similarly."

"For *delicate folk,* secure the inner skin of chickens' stomachs, dry, and give frequently a quantity that might cover a copper penny."

SIXTEENTH CENTURY REMEDIES FOR LIVER AILMENTS AND DROPSY

"For *all ailments of the liver:* secure the liver of a stag or deer in the month of May; hack fine; add cinnamon, clove, saffron, sweet-scented woodruff, hart's tongue, speedwell, hyssop, rosemary, and sage, a handful of each cut very fine; pour on white wine, neat's tongue water, and endive juice; keep well covered for a day, then boil. This will cure every ill resulting from *sluggish liver or other liver trouble.* Take a small tumblerful on an empty stomach every other day."

"For *jaundice,* nothing is better than the yellow skin from the stomachs of chicken. Wash clean, dry, pulverize; add an equal quantity of fine sugar. Take as much as might fill a hollow hazelnut, in hot water two or three times every morning, but in hot wine at night before retiring. Centaury plant, mixed with sugar, is also effective, and may be taken with the foregoing or by itself. As a helpful outer remedy in connection with the medicine, secure two young pigeons not yet able to fly; place them on the breast of the patient for several hours or until they [the pigeons] die. Or, if you had rather not have them die on the chest of the sufferer, remove betimes and replace with other pigeons. The birds will draw the jaundice out."

"Or, take the droppings from a brown horse, three or four balls; let your own urine run over it, in the morning, in quantity as much as you can command at one time on rising; mix well; put into a cloth, and hang in a chimney where smoke is plentiful. When good and dry, burn to powder, and use this powder." [It does not state whether inwardly or as a salve, but the medicus adds:] "If the remedy is not effective at once, keep on using it."

"For *dropsy,* take grease from a fat castrated dog, enough to fill the shell of a walnut; put into hot beer and give to the patient. Also put a little of the fat into the food of the sufferer. At any rate see that he gets some of it every day. The more the speedier the cure."

SIXTEENTH CENTURY REMEDIES FOR KIDNEY AND BLADDER DISEASES

"For every *malady of kidney or bladder,* take seed of quince and of pumpkin; boil, and save the slimy juice. Let stand for two days; put through a sieve; squeeze out thoroughly. Then take equal quantities of oil of mandragora and the milk of a woman still suckling a female babe, about two or three spoonfuls; add the white of an egg; boil, stirring thoroughly and continually. When cold, this will give you a salve with which you are to smear the aching parts morning and evening."

"For *stone in the bladder,* secure a wren—be sure it is no other little bird—cut its meat very fine and give to the patient raw, well mixed with salt. Or, if you prefer, dry the meat and give powdered. That will be sure to melt the stone, which will pass away with the urine. It has always proved successful with me. But assuredly the remedy is more effective when used fresh than when dried. I once gave it to a boy of thirteen, whose father had already arranged with a stone operator for ten guilders; and within three days the stone had melted and passed away in the urine, without any need of the knife."

"Against *gravel in the bladder:* take droppings from field pigeons (by no means from domestic pigeons); starve for a day or two before killing; cook thoroughly and pickle in wine and vinegar. Give a little of the juice mornings on an empty stomach. three mornings in succession, until the pain subsides. But if results should not be prompt and the pain grow almost insufferable, put the patient into a hot bath while giving him small quantities of the remedy."

"Excellent for *stone in the bladder* is also blood of a fox, but it must be a male. Smear it well about the genitals until they are completely covered. That will surely cause the stone to melt and pass away with the urine."

"For *inability to make urine,* secure white dog's droppings, make a dough with warm white wine, and put on the patient's navel. That will help. Or use sheep manure in oil or grease, knead till soft, place in a doubled cloth on the patient's abdomen. Or make a clyster of white wine in which you have boiled fresh donkey's manure; squeeze till fairly dry and apply as hot as can be endured. That will help."

"If the *urine passes blood,* take twenty melon seeds and as many cucumber seeds; let stand overnight in goat's milk; heat, and let the patient drink the juice hot, night and morning, until a cure is effected."

"For any *pain in the genitals,* the aforementioned salve of white dog's droppings in wine will prove helpful. But for continued pain take a living crawfish or two; mash and dry; apply to the suffering parts. These remedies are good for both men and women. The privy places should continually be washed with wine, especially where the pain is most acute. A powder of tartar, first washed in wine and boiled with a little alum, is helpful *when holes have been eaten into the privy parts.*"

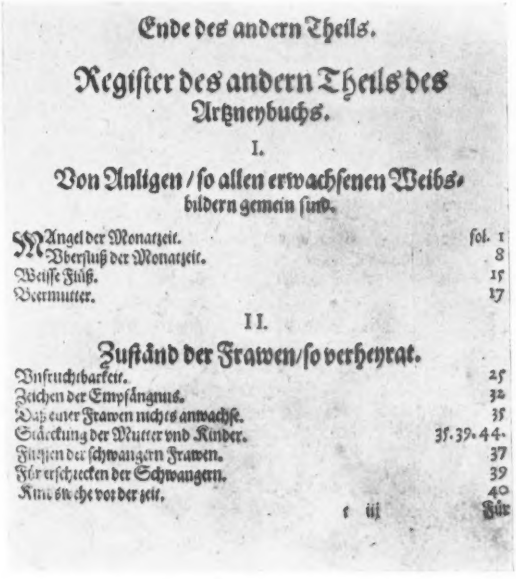
SIXTEENTH CENTURY REMEDIES FOR GOUT, CRAMPS, AND WOMEN'S DISEASES

"For *gout and podagra,* apply a plaster of swine's and cow's droppings, mixed with fox grease or, if you can secure it, grease from vultures. Or cut up a lot of onions and boil well in the patient's urine; use as a plaster. Or boil a lot of ants with their eggs and moisten a cloth in the mixture; apply to *the aching parts.*"

"For *cramp,* hang the tail of an otter about the patient's neck. That will drive the cramp away. Or you may hang the teeth of a March hare about the sufferer's neck, next the skin. This has proved very helpful. Or take a long peacock feather and bind about the aching limb or other cramped part."

"If you have *become lame in hand or foot or other part,* fill a fat goose with garlic, boil till you have

(Continued on Next Page)



Ende des andern Theils.

Register des andern Theils des Artzneybuchs.

I.

Von Anligen / so allen erwachsenen Weibsbildern gemein sind.

Angel der Monatzeit. fol. 1
Vberfluß der Monatzeit. 8
Weisse Fluß. 15
Beermutter. 17

II.

Zuständ der Frawen / so verheyrat.

Vnfruchtbarkeit. 25
Zeichen der Empfängnus. 32
Daß einer Frawen nichts anwachse. 35
Stärckung der Mutter vnd Kinder. 35.39.44.
Fürsichtigkeit der schwangern Frawen. 37
Für erschrecken der Schwangern. 39
Kindsnöthe vor der zeit. 40

t iij Für

Fig. 5.—A page from Part III, devoted to diseases of women. Translation follows:

END OF THE OTHER PART
REGISTER OF THE OTHER PART OF THE ARTZNEYBUCH

I

ON DISEASES COMMON TO ALL WOMEN

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Scantiness of menstruation	1
Excessive menstruation	8
White discharges	15
The uterus	17

II

DISEASES OF WOMEN WHO ARE MARRIED

Sterility	25
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* * *

The remainder of the contents dealing with women's ailments, is printed here to show the variety of the topics which were considered:

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Premature birth	45
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Superabundance of milk	70
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* * *

In connection with the above and on the page opposite this reproduced register of contents, alone and in display set-up, was printed the following foreword or admonition concerning the discussion of the ailments and treatment procedures for women which followed:

ADMONITION TO THE READER

This portion of the book contains not a few items of a more intimate character which, while recorded for the benefit of the sincere and kind-hearted only, might be used by the vicious for mischievous purposes. Against their practices I again and most urgently warn the reader.

In the first place, let the reader use nothing without much consideration and serious forethought, as the best of medicaments are often more harmful than beneficial when not properly compounded and carefully used. Moreover, the reader must not use for knavish purposes that which God has made for the good of mankind. Incur not therefore the wrath of God, nor draw down on yourself both temporal shame and eternal punishment.

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secured a goodly quantity of grease, with which salve the affected parts."

"For *irregular or insufficient menstruation,* fill a little bag with myrrh, press to the abdomen; keep quiet and warm. Or cut off the right forefoot of a living mole and of the blood that trickles from the wound give about three drops in wine. That will restore the flow or cure the pain."

"For *too profuse a flow,* cut several nutmegs small, add wheat flour, and make a dough; bake. Apply, as hot as the patient can stand it, to the navel and the privy parts until the flow subsides."

"To cure *the whites (leucorrhea)* or any *malady of the uterus,* take cow manure as promptly as you can get it to the patient, so as to be still warm, add a good draft of wine with some cloves, stir well and give the patient a hot drink of it. Keep her well covered and get her into a heavy sweat. That will help."

"Nothing will bring about *pregnancy* quicker than fresh eggs eaten on an empty stomach; they must be eggs of hens left without a rooster for at least a month. Or take some of the foam from a rabbit's mouth when gnawing poplar wood. At the next intercourse with her husband she will conceive. Or give her rabbit meat from a female that has had young; but keep secret the kind of meat. That very night have her husband cohabit with her. Pregnancy will be sure to result."

"*If in doubt as to whether she is pregnant or not,* have the woman eat three slices of quince in sugar or honey (whichever she prefers) on an empty stomach for four weeks in succession. At the end of that time, if pregnant the fact will be more apparent, as the child has been strengthened by the remedy. If there is to be no baby, whatever there has been before will have passed out by that time."

"In *difficult parturition,* while the woman is in the throes, give her a spoonful of dog's milk. If nothing else will help, that will."

"If *after giving birth the woman lack milk,* take the udder of a cow, cook it well, slice, and bake hard; powder; add fennel, kimmel, and sugar; mix. Give three times a day in hot beer or wine, about as much as you can hold on two or three fingers. She may also eat a little of the dried powder. It will help."

"For *painful breasts,* secure a dozen crawfish eyes and one good nutmeg; powder fine, add white wine, cover well for two or three days. Give the woman a spoonful night and morning, at night at least two hours after the evening meal. Wash the breasts frequently in lye water and be very circumspect with food and drink."

SIXTEENTH CENTURY REMEDIES FOR FEVERS

Fever, or any sickness in which fever is the dominant feature:

"Secure the hearts of three pickerel, keep about an hour in sharp vinegar, and eat raw. This has long been a famous remedy in Italy, especially in Venice. It is a very current practice in any case of fever to open the median (cephalic) vein of the arm, no matter which arm. This gives immediate relief and will prevent a recurrence of the fever for a year at least. For a *three-day fever* try your best to have the patient swallow a fresh pickerel heart at one gulp; if impossible, get it into him as best you can."

"For *hectica or severe loss of weight (consumption),* take some woman's milk and an equal quantity of almond oil; with the mixture rub the whole breast of the patient with your hand, gently and long, especially after giving the patient a bath. It is always best to secure the milk from the mother of a girl baby. For greater effectiveness, add a small quantity of gum arabic. As an inner remedy for the same malady, secure a large quantity of large crawfish, wash thoroughly and dry carefully; put into a clean pot and pour goat's milk on them; let stand until all the crawfish are dead." [*"Quod ego non probarim,"* adds the medicus.] "Then boil well together. You may add some sage and hyssop, about a handful of each, according to the number of crawfish. Give the patient a hot gobletful of the liquor three hours before eating and before going to sleep at night."

"For *erysipelas,* wherever it may occur, apply goat's milk while yet warm from the animal to all the red and swollen parts."

"In any *pestilence,* have garlic juice mixed in hot wine with vinegar and theriaca. Give a spoonful. If it is not retained, force it into the patient, keeping his mouth closed with a thick slice of bread. Or take an onion; put into it a quantity of theriac [this seems to have been the panacea for all sweepingly prevalent sicknesses: the "flu" probably, or the "black death"] and bake in hot ashes. As soon as soft add a spoonful of good vinegar. Stir well and squeeze the mixture through a cloth. Heat again, give to the patient, and put him into a good sweat. Take a live rooster, pluck his breast feathers, and bind him, living, to the patient's *sore places, boils, and swellings,* and effect a cure. Be sure to bury the rooster after having proceeded as directed. Instead of a rooster, many take a green frog and bind it, living, upon the swellings, keeping it there until it dies. Note that if the frog turns white, it is a sure sign it has drawn the poison to itself, and a cure is likely to follow. This is a remedy, however, to be used with extreme caution, since anything cold is apt to do more harm than good."

SIXTEENTH CENTURY REMEDIES FOR WOUNDS*

"*Wounds, no matter how produced,* whether through stabbing, cutting, hitting, falling, shooting, falling into or onto something, be it iron or other metal, thorns, or anything sharp or blunt whatever, which may injure the skin or flesh of any part of the body:

"*If produced with iron or any weapon whatever,* secure the weapon if you can and bury it deep in the soil until a cure is effected; then you may pull it out again. After burying the weapon, take root of meadow saffron, pound well in a pestle, with a few drops of vinegar, make a plaster of the mixture and apply on a cloth to the wound. But *if the wound is very deep,* some of the remedy must be inserted into it, to speed healing and prevent swelling. Reapply the plaster whenever dry, and continue till healed. If the wound has been made with wood, a splinter or thorn or the like, use the foregoing as directed; whatever entered the body will be drawn out without danger of swelling, festering, or excessive pain.

"Another fine remedy for *wounds,* originating with the world-famous surgeon Monsieur Hansen of Paris, is to take white of egg, honey, finely powdered bruisewort, rose oil, linseed oil, ribwort, and endive juice, equal quantities; mix; dip perfectly clean hemp or flax into the mixture, to make a plaster bandage, the broader the better, and apply to the wound, first putting a little hot turpentine on it. But under no circumstances use turpentine *if it is a skull wound,* especially if the brain is exposed, though you may put a little on a feather and pass softly over the wound, avoiding getting any of it on the skin of the brain.

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* Ed. Note:—After reading some of these sixteenth century remedies for wounds, as used by Europeans, one can with profit turn to the May 1930 issue of California and Western Medicine, page 375, where an item is printed on certain surgical procedures in vogue among some of the natives in equatorial Brazil, at the headwaters of the Amazon.—G. H. K.

But the bandage with the remedy you may keep on the head continually, renewing it from time to time until the wound is healed. Give the wounded person a small quantity of pimpernel and dog's mercury powdered and mixed, administered in wine. If retained, you may confidently look for recovery; if the patient spits it out, it is a bad sign and the chances are that he will die.

"For *festering wounds,* secure strawberry bushes, dry, burn to powder, and sprinkle into the wound.

"For *worms in wounds,* use hot grease or tallow; drop a bit into the festering places; this will not only kill the grubs, which will fall out, but speed recovery. It is also effective for cattle.

"To *open a wound* that has not healed properly, secure some urine from a three-year-old boy, mix with burnt chalk into a soft paste, and apply. That will open the wound without unnecessary pain.

"To *draw out an iron arrowhead, or a bullet,* take gander droppings and apply night and morning to the wound. This will draw the missile near enough to where it entered for you to pluck it out with your fingers. If applied in time it will also prevent festering. If it is impossible to remove the arrow or bullet, secure some unslaked lime, about a handful, several living crawfish, several fresh hen's eggs, a spoonful of good honey, several ounces each of ground mastic and good theriac, and mash all thoroughly in the pestle to the consistency of a thick porridge. Make a plaster large enough to cover the wound and apply on a hempen bandage. Renew frequently and it will heal the wound, though it may or may not remove the missile. Give the patient from time to time a draught of quince juice into which you have mixed a small quantity of saffron and wine-vinegar, to keep him alive.

"*Splinters of glass or wood* are frequently drawn out with an ointment made of ground garlic and gladiolus. It will soothe the pain, too, and prove healing.

"Do not attempt to *staunch the blood from a wound* caused by weapons, etc., but let it flow as long as it will; otherwise you are apt to kill the patient; for if it does not come out it will run inwardly and coagulate in the body, and the injured one will at best be crippled or a chronic patient for life. So pay no attention to the wailing mob about you begging you to stop the bleeding lest the man die. Assuredly he will not die of that feature of the injury; it is certainly far better to let him bleed than for the blood to fill his belly. Wait till the bleeding has stopped completely and then bandage the wound, and not before. The only thing you can do to lessen the bleeding is to give the injured one an occasional drink of burnt bruisewort [symphytum officinale]; and you might apply myrrh in cold-water bandages to his hands and feet which will help to check the flow of blood. Indeed, having been shot, it will be well if the man bleed lively, even though it may mean a sickbed for some time to come. That is infinitely better than any attempt to staunch the flow of blood; the patient will recover all the more quickly."

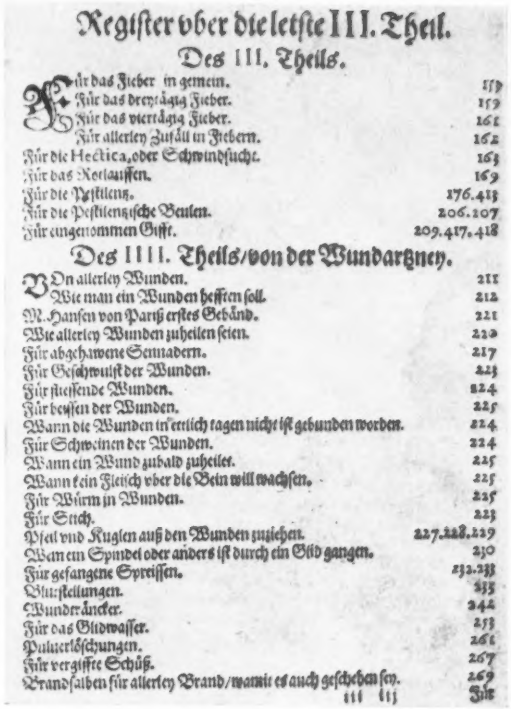
SIXTEENTH CENTURY REMEDIES FOR WOUNDS, CANCER, SYPHILIS, AND MISCELLANEOUS CONDITIONS

"An excellent *healing drink* is made of a quantity of crawfish eyes, to each nine of which a nutmeg; mash fine together; put into a pot of good strong wine; seal well to preserve the aroma; let stand a while. Give the patient a heaped tablespoonful mornings on an empty stomach and at night before dropping to sleep."

"For *sore breast,* no matter what the malady, lave frequently with lye water and place a brown cabbage leaf on the breast."

"For *synovial secretions:* Secure the leg of a human skeleton; burn to powder in a new pot, as fine as flour; knead into small dough cakes and dry in the sun; bake in a clean pot. Now burn some alum and moisten with brandy. Then take an ounce each of the cakes and the alum and add some rosewater, brandy, and white incense; mix thoroughly; dry in the sun. Before applying, pulverize and add white of egg; use just as you would any egg plaster. This will stop the secretions. *Probatum.*"

"Any *wound caused by scalding, burning, gunshot-wound burns,* etc., will be readily healed by the following remedy, known as the 'Georg Neubacken Pulverlöschung': Take nine living crawfish [nine seems to be a magic number in effecting cures. Why?] mash, and secure all the juice; add a tumblerful of night-



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Für

Fig. 6.—A page from the contents of Part III, dealing with certain fevers and with certain wounds. Translation follows:

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THE THIRD PART

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shade juice and of leek juice; mix well. Before applying, smear a little lard into the wound, which will be sure to heal, with the help of God."

"One of the most effective cures of *gunshot wounds* in the late Peasant's War was the juice of sauerkraut freshly taken from the barrel, well strained through a cloth. Soak a cloth with it and apply. For severe injury, add a little white vitriol; for lighter wounds, the white of an egg added will make the kraut juice yet more effective." [Nowadays they take the stuff inwardly as a general prophylaxis.]

"Fresh quince juice squeezed into a *wound* will always draw out its *poison.* More effective still is the powder filed from the forehead of a human skull and given to the patient in water or, better, beer. This will help promptly."

"For *coagulated blood:* Take a handful of rainworms; put into sand, in which let them crawl about; then wash them well in clean water and mash thoroughly in a mortar; secure all the juice and mix with olive oil. Heat, and give the patient a drink of it every three or four hours, in beer, wine, vinegar, or, best of all, in neat's-tongue water."

"Rain-worms are also an excellent remedy for *injured veins and for shrunken limbs.* Secure as many as you can and bind them, living, to the suffering, maimed, or injured parts, until they die. Then add a new lot, and keep renewing until they cease to die. All you need to do then is to apply the following salve until a complete cure is effected: eight grams each of dialthae agrippae, cow marrow, snake grease, badger grease, hen grease, oil of camomile, oil of dill; add a little wax and you have a most effective salve. *Probatum.*"

"Pure capon grease, smeared into wounds or applied to *shrunken veins,* well bound with a dog-skin bandage, is very helpful; it will lengthen the veins even if you are on the point of growing lame."

"If *bitten by a mad dog or wild animal,* especially if the wound is large and bleeds but little, take a sharp knife and cut well into the wound, causing it to bleed freely. Now take a linen cloth, moisten in olive oil, and place on the wound. Next, toast some bread and bind very hot on wound and oil. This will draw the poison out of the wound, which will heal like any other injury. But make sure to bury the bread and bandage after using, or they will infect others. Don't be in too great a hurry about the cure."

"For *snake bites, spider bites, and the like,* take a living hen or rooster and pluck the feathers from the rump; hold that part solidly over the wound and it will draw out the poison. Should the chicken die in the process, quickly secure another.

"Or: cut a living hen in four parts: apply one of the parts, still warm, to the injured part; keep on for about a quarter of an hour; then take the second part and keep it on for an hour; the third part likewise for an hour; but the last should remain for two hours at least. When you have removed the fourth part it will have drawn out the poison completely, with God's help."

"For *putrid or festering sores,* secure mussels you find lying on river shores; wash well; remove skin, which burn in a strong new pot, well closed. Pulverize, and strew into the wound; it will dry it up and effect a speedy cure."

"To cure *sphacelus or mortification,* secure fresh human or bull's excrement; bind with cloth to the wound. Renew when hardened. Or: take the urine of a virgin at the time of her menstruation; moisten a cloth with it; apply to the wound. *Probatum.*"

For *frozen limbs,* cat grease is excellent. You may add to it a quantity of sulphur (about a quarter of a pound, ground fine); mix with ground pepper; add a small quantity of butter; boil together and apply the mixture as a salve."

"For *mange or itching of any sort,* rub the parts frequently with the yolk of an egg to which you have added a quantity of fine salt; take a hot bath and get into a good sweat; but see to it that your body is rubbed clean of all dirt before you get into the bath. Or: a mixture of milk, vinegar, and salt, boiled together, and applied frequently, will stop the biting and itching."

"For *whitlow suppuration or felon,* on the finger: Take the patient's own stool and bind in a bandage to the sore part. Not a very cheerful [unlustig] remedy, to be sure. Or you may take cat excrement and bind similarly to the finger. Some mix it with honey, others use it in wheat flour. Not a very cheerful process either, but a most effective one. Or you may take pig's gall if you prefer, or the gall of a fox is even better; bind, preferably, with the skin of the gall bladder."

"For *cancer, or other eating sores,* or *worms in the sores*: Heat the juice of peach-tree leaves, small burrs and nettles; moisten a cloth with the mixture, and apply. Or: wash the sore thoroughly in human urine; then apply a powder made of quince and living crawfish burned together in a new pot. It is well to put a little vitrioli Romani into the urine. Another excellent remedy: moisten a cloth *in menstruo mulieris* and apply. That will help if applied in time; if too late, the application will hurt insufferably a short time before the patient's death. Sheep manure applied while yet warm is another excellent remedy for cancer. Or: take the tongue of a wolf, dry thoroughly, powder; make into a salve with flour and honey. Before applying, wash the sore places well with wine."

"For the *French malady (syphilis),* smear the affected parts well with petroleum; then apply a bandage of burnt incense; use several days in succession. Or: put three grams of quicksilver into a spoonful of brandy and vinegar; add a little spittle; shake well until the quicksilver melts; add laurel oil and laurel powder; mix in a pot with the quicksilver. Apply the salve to the affected parts."

"For *warts,* apply rainwater taken from cow droppings. Or: take a number of black snails and boil in water, with which wash the warts frequently. Or: put the snails into a pot; sprinkle generously with salt; use the resultant fluid as a wash. Or: mix equal quantities of salt, mustard, and sulphur in vinegar; wash your hands with the mixture."

IN CONCLUSION

So far, the translations. They constitute, of course, but a small part of this voluminous old book of medicaments, which is now owned by the editor of CALIFORNIA AND WESTERN MEDICINE. The book contains many hundreds of prescriptions of all sorts. The choice of excerpts was naturally dictated more or less by the startling character of a particular recipe, or else this article would have assumed undue proportions. It must be remembered that the *Artzneybuch* contains any number of prescriptions that are not very unlike those still used by any housewife, or the man in the street, in preference to the recipe of the legitimate physician. And for that matter, the book gives many a prescription that might readily find a place or still has a place in the materia medica of any modern reputable doctor.

Another thing. The reader should not hastily conclude that this medical treatise is representative merely of the state of medicine in the Germany of the period. Throughout the *Artzneybuch*

occur references to and grateful acknowledgments of this and that physician of France, Italy, and other countries to whom Court Physician Gäbelthouer feels himself indebted for a specific prescription. Hofmedicus Gäbelthouer is chiefly a compiler of what up to his time had survived as best and most effectively tried in medicine everywhere. Let the reader but refer to the very interesting history of medicine pointed out in the footnote to the title of Part I of the present article: "Devils, Drugs and Doctors," the strongly illuminating work of Dr. Howard W. Haggard of Yale. Let me quote from it a single representative paragraph in substantiation of what I have just said. It occurs on page 328:

Disgusting substances formerly were used as drugs, largely because of the impression they make on the sufferer. Such substances were extensively employed because they were cheaper than mummy, unicorn's horn, bezoars, pearls, and potable gold, which were the remedies of the nobility. Cotton Mather used crushed sow bugs in his practice and body lice, and incinerated toads have also had their place in medicine. When Robert Boyle expurgated the pharmacopeia of its most dubious remedies, he nevertheless included in the revised list the sole of an old shoe "worn by some men that walked much," which was to be ground up and taken internally for dysentery. Insects, toads, and old shoes were the least objectionable of the many remedies of that age. In the late Middle Ages the apothecaries of Europe complained that most of the crocodile dung they received from Egypt was adulterated by dishonest traders. Excrement and urine have had a notable place in medicine, and Pliny in his "Natural History" speaks highly of the medicinal virtues of menstrual blood. This last substance, in addition to its effect on disease, would kill insect pests at a distance and even quell storms at sea. The physicians of the sixteenth and seventeenth centuries apparently tried to make the deaths of their patients as unpleasant as possible; when Cardinal Richelieu was on his death-bed a female charlatan prescribed for him a mixture of horse dung in white wine, and the cardinal drank it. In the eighteenth century Fauchard, a Frenchman who made notable contributions to dentistry, advised his patients to use their own urine as a mouth wash in case of toothache. Urine was an old remedy, but subject to occasional revival; Madame de Sévigné recommended it highly in the eighteenth century.

The comments given with the excerpts are those of a layman, a student and teacher of Spanish, who has lately been intimately studying the works of a Spanish novelist and essayist, Ricardo León, who finds everything splendid in "the good old times" and everything pretty bad in our day. I wonder if the old times would seem so good to Ricardo León after reading a medical work like the *Artzneybuch* or Haggard's startling volume, "Devils, Drugs and Doctors."

And as a final word, the translator wishes to make it clear that he has made no research in medical literature of the *Artzneybuch's* period; he is merely the translator and commentator of what, on the face of things, appears to be a representative and authentic work on the medical practices of the Germany of the sixteenth century.

University of California at Los Angeles.

CLINICAL NOTES AND CASE REPORTS

THE PROBLEM OF THE SKIN GRAFT*

WITH DESCRIPTION OF NEWER TECHNIQUE

By H. L. Updegraff, M. D.
Hollywood

THE collector of old medical books will assure us the problem of skin graft is one whose existence was undoubtedly recognized by the early Hindu surgeons, whose works comprise the borderland of early surgery.

The literature up to ten years ago was sustained largely by recapitulations of the work of Thiersch, Wolfe, Krause, and others, and has been admirably reviewed by Davis, Neuhof, and Hunt. The avalanche of cases with epithelial defects engendered by the Great War stimulated research of the question why measures successful in the hands of many were yet fraught with dangers of failure and avoided by the majority.

The result has been at the present day that confidence has been greatly restored by the knowledge that the average graft will survive in a large percentage of cases if ordinary asepsis is maintained along with sufficient pressure of the dressings to approximate normal tension. This holds true for the thin (Thiersch), split, and full (Wolfe) skin grafts, all of which exist for the first four or five postoperative days as parasites in their own and surrounding lymph juices.

CHOICE OF GRAFT

The problem of which type of graft to use is one for the individual exercise of judgment. The depth of the defect to be closed, the character of the base, and the ability of surrounding tissues to sustain pressure, are factors of importance. The cosmetic effect of final coloration is biased by the thin graft's tendency to reddish discoloration and the full graft's likelihood of tanning. The size of the graft is limited physically by the ability to keep correct pressure on it during dressing. Grafts should be cut to fit accurately, with the exception of the thin grafts which are cut large so as to overlap either the defect edge or adjoining graft. Drainage should be by perforation and anchorage of all grafts by suturing (waxed silk), to insure normal tension. The more delicate the graft, the less handling the better. The pinch graft has been abandoned along with the forlorn hope of autografts, even with similar blood typing.

The universally accepted preparation of skin for use as a graft seems to be thorough scrubbing with soap and water, followed by rubbing with ether until the skin is glowing. The treatment of the area to be grafted consists of relief of constrictions if present, which involves undercutting and trimming of area edges sufficient to present

* Read before the Southern California Medical Association, Santa Ana, April 5, 1930.

an acceptable suturing edge. An area covered by granulations should be sliced off flatly until a yellow scar base is reached. Control of hemorrhage is made by pressure while the graft is being cut to insure a recipient dry bed. When preparing to graft a potentially infected area, such as an old carbuncle site, it should be borne in mind that a complete new setup of instruments and sterile goods is necessary that infection be not carried from the field to be grafted to the area furnishing the graft.

The advance in technique knowledge allows more daring in plans. Very large full thickness grafts may be contemplated with assurance if first elevated on three sides and resewn for a period of ten days with proper drainage. Hair-bearing grafts as a rule do better if the donor site is shaved for a week before and exposed to air and sunlight during the interim. Total rhinoplasties have proved very successful through the elevation of the forehead flap and the planting of a graft, thin or thick, on the underside of the flap, depending on depth of nasal deformity necessary to replace. The graft attachment offers a splinting against contracture which allows cutting the flap almost to size. The success of the Esser inlay in optic, nasal, and oral cavities, has led to its use in the construction of congenitally absent ear canals and deficiencies of vaginal vault, urethra, and imperforate rectum.

The general acceptance of the pressure dressing has given an easily applied more or less standardized procedure. The use of parresine mesh impregnated with three per cent xeroform unguent with a petrolatum base offers an antiseptic medium with a splinting and draining capacity. This combination with a moist marine sponge applied with firm bandage pressure approximating the feel of a tense deltoid muscle gives our best results (Fig. 1).

Correct pressure dressings are difficult unless satisfactory immobilization can be obtained. Use of plaster of Paris, splints, bandages, pressure bags, sand bags, rubber sponges, body position, stent inlays, nasal splints—all contribute to the solution of the particular problem at hand. The pendulum has seemingly swung away from the idea of laying on the graft and protecting it by a wire cage. The goal striven for is the normal close apposition of the skin to underlying tissues for a length of time sufficient to permit a new circulation to be established.

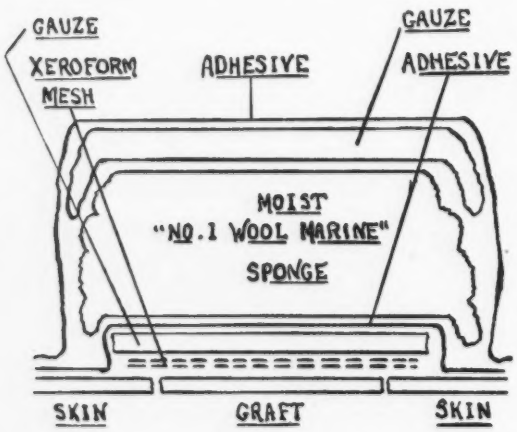


Figure 1

INFECTED GRAFTS

Early recognition of infection in a graft and its treatment are usually regulated by experience. Grafts, under pressure, which become infected usually register quickly a septic temperature, malaise, and a feeling that all is not well at the graft area. If in doubt, there is no reason why the graft should not be inspected at once, the few moments release of pressure not being important. Contrary to accepted belief, we have found tincture of iodin as distinctly beneficial and not injurious to the graft. Yellow mercuric oxide unguent, one per cent, is an excellent emollient when the epithelial layer is denuded. Dressings once or twice daily during the critical periods are oftentimes indicated if appreciable salvage is to be had. Warm moist dressings after the tenth day are of value.

The use of heliotherapy in preparing the area to be grafted and in treatment of the denuded grafted area if an epithelial slough takes place, is an important help. In aged or debilitated patients with a negative urine the administration of 50 to 200 grams of dextrose per orem each day, followed by one unit of insulin to each 10 grams of dextrose in an hour's time, is an aid both in pre- and postoperative treatment.

Skin grafts on the face, head, and neck present an added difficulty in surgical technique, due to anesthesia. Even in using local anesthesia, hemorrhage into the nose or mouth is a problem, not only because of soiling of the field but also because of postoperative vomiting, which contaminates and displaces dressings. We have been greatly benefited by the use of the intratracheal tube which tends to obliterate the pharyngeal opening, thus allowing irrigation and aspiration of the mouth and nose as well as keeping blood and mucus from being swallowed or aspirated. Patients who are faced with the necessity of repeated operative stages do well with sodium amytal induction in their rooms, followed by intratracheal anesthesia with ethylene gas. In some long-drawn-out head cases we have combined, with very satisfactory results, the use of a sodium amytal, intratracheal tube in place and an oil ether colonic anesthesia.

The average surgical textbook depicts the methods used in cutting the various grafts. Where there is any suggestion of developing a hypertrophied scar at the site from which the graft is taken, we have found it better to cut a full thickness graft and shave it to desired thickness from the inner side. The resultant deficient area from which the skin is taken can usually be drawn together with a much better cosmetic result by adequate undercutting or use of recognized

plastic procedures such as sliding flaps or necessary ground-gaining incisions.

We have been using with satisfaction a combination graft so cut as to embody all three types, where the problem has been to fill a defect with a deeper crater than edge.

SUMMARY

1. Grafts are parasitic for the first four to five days of implantation.
2. Type of graft to be used depends on thickness and coloration desired.
3. Preparation of donor area and graft site are simple cleanliness and control of hemorrhage.
4. Marine sponge pressure dressing is best all-around measure.
5. Infected grafts should be dressed daily or oftener. Dextrose and insulin administration are of benefit.
6. Sodium amytal, intratracheal and rectal anesthesia in selected cases offer a medium, allowing a greater latitude for work.
7. The possibility of a single graft so cut as to embody a thin edge and thick center is to be remembered.

6777 Hollywood Boulevard.

IMPROVISED DARKFIELD APPARATUS*

By S. E. LIGHT, M. D.
San Francisco

EACH year a great many patients with primary lesions of syphilis go undiagnosed and untreated. A recent review of 838 histories of luetic patients at Stanford indicates that in many instances physicians saw these patients and failed in diagnosis. A large number would have been recognized and treatment instituted in the most auspicious stage had the physicians been equipped for darkfield examinations.

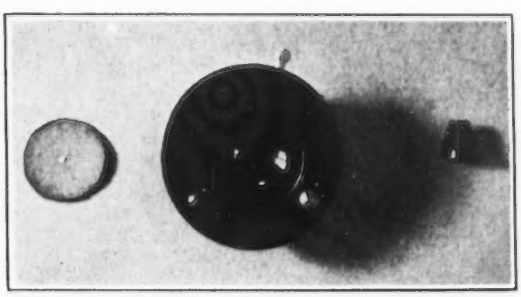
With this in mind, I wish to bring to attention a simple and practical method of improvising a darkfield, described by Coffin in 1920 (*Journal American Medical Association,* May 22), using the ordinary laboratory microscope, with which every office is equipped. According to Coffin, a piece of black paper, the size and shape of a quarter, pasted on the center of the lower convex surface of the Abbé condenser of the ordinary microscope, will make a darkfield apparatus for examinations for the *Spirochaeta pallida.* The high, dry (4 millimeter) objective is used, and the light regulated with the lower shutter of the condenser. I have used this method, but prefer the greater magnification and detail obtained by the oil immersion lens. This objective may be used, provided it is equipped with a funnel stop, which is inserted into the casing of the objective above the lens system. By cutting down the normal aperture, this stop prevents the diffuse glare which otherwise obscures the field. The price of a stop is about ninety cents.

Proper illumination for darkfield work is best obtained by using a 75 to 100 watt lamp. This should be enclosed or covered to prevent glare on the eyes, and its rays should be on a level with the reflecting mirror of the microscope.

When the specimen to be examined and the microscope are in readiness, a drop of immersion oil is placed on the upper surface of the condenser, which should be level with the stage of the microscope. Next the slide is placed on the stage so that its undersurface makes even contact with the oil without bubbles. Then another drop of immersion oil is placed on the cover slip, and the specimen is ready for examination with the oil immersion objective in the usual way. An excellent darkfield may be thus obtained.

Stanford University Medical School.

* From the skin and syphilis clinic of Stanford University Medical School, San Francisco.



Abbé condenser, funnel stop and paper, showing size of the paper in comparison to the inferior surface of the condenser where it is to be pasted.

Radium for the New York State Institute.—A contract, representing an expenditure of more than $291,000 for 5735 milligrams of radium and accessory equipment to be delivered to the State Institute for the Study of Malignant Diseases at Buffalo, was recently signed by Dr. Thomas Parran, Jr., State Commissioner of Health. Certificates of the United States Bureau of Standards attesting the quantity of radium element will be delivered with the material. The purchase was made possible by an appropriation of $300,000 for the purpose at the last session of the state legislature. With the acquisition of this additional radium, the institute, so far as known, will possess the largest single supply in the world.

The State Institute for the Study of Malignant Diseases is under the supervision and control of the state department of health. It was created for the purpose of conducting "investigations into the cause, nature, mortality rate, treatment, prevention and cure of cancer and allied diseases," and is authorized to "receive in its hospital for study, experimental or other treatment, cases of cancer and allied diseases free of charge." There are records of over eight hundred cured cases of malignant disease in the institute files.—*Health News,* July 14, 1930.

The Marie Curie Radium Institute of Warsaw.—Because of a year's delay in obtaining radium for the Marie Curie Radium Institute of Warsaw, for which Madame Curie was given $50,000 in 1929 by a group of Americans, the hospital will not be able to open its doors until December. The delay has had its advantages, however, for the interest on the money will be sufficient to purchase platinum screens for the radium when it becomes available. Madame Curie said that the demand for radium was now so great that the producers are far behind in filling their orders. Only one gram is required for the Warsaw hospital, and, although it was ordered last November when Madame Curie returned with the purchase money, its delivery will require another five months.—*Science,* July 25, 1930.

BEDSIDE MEDICINE FOR BEDSIDE DOCTORS

An open forum for brief discussions of the workaday problems of the bedside doctor. Suggestions for subjects for discussion invited.

ACUTE POLIOMYELITIS

ETIOLOGY

GEORGE M. STEVENS, LOS ANGELES.—In 1909, Landsteiner and Popper produced experimental poliomyelitis in monkeys from washings present in the brain and spinal cord substance. Very soon after this, Flexner and Lewis, Landsteiner and Levaditi, and others succeeded in transmitting the disease from monkey to monkey and definitely proved that the specific cause lay in a filtrable virus, found at times in the central nervous system, in and on the mucous membranes of the gastrointestinal tract, in the adjacent lymph nodes, in the tonsils and salivary glands of those afflicted, also that it was not found to an appreciable extent in the spinal fluid or the blood.

The virus passes easily through a "Berkefeld" filter, less rapidly through "Chamberland's."

Man is the only animal subject to poliomyelitis and to epidemics thereof.

The only other animal susceptible is the monkey, then only in an experimental way, when the virus has been stepped up.

The virus withstands exposure to heat, cold, light and drying rather more than do ordinary bacteria. It retains its virulence or oftener increases it in the height of summer heat. It is not destroyed by the ordinary weak antiseptics so frequently applied to the nose and throat. It will keep in glycerol five or six years and is not injured by a 0.5 per cent phenol.

It is rendered innocuous by heating one-half hour at a temperature between 45 degrees to 50 degrees Centigrade. There are great variations in the strength of the virus both as it occurs in humans and experimentally in monkeys.

At times it assumes extreme virulency, most epidemics occurring during the hot summer months.

The virus produces an active immunity in both monkeys and man; the blood serum from convalescents contains substances that neutralize the virus in both.

Some investigators question whether filtrable viruses are really living organisms and not rather of a chemical nature similar to enzymes. Because microbic origin has been proven in many diseases it does not necessarily follow that filtrable viruses contain minute organisms of a like nature.

What is the nature, then, of the globoid bodies of Flexner? The first eight and even the twentieth transplant of these bodies produced typical experimental poliomyelitis and yet experiments directed to show an immunological relationship were negative. The present working hypothesis is that the globoid bodies absorb and either chemically or mechanically afford proper respiratory conditions for the nurture of the true virus.

It would seem that streptococci and other coccic organisms found at times are merely secondary invaders.

It is a maxim in Preventive Medicine that those diseases most difficult to prevent or control are the ones in which there are the greatest number of healthy carriers.

It has been proven experimentally with monkeys that contacts with poliomyelitis, although themselves healthy, are nearly always carriers. No other disease that assumes epidemic proportions has so large a number.

Given.—1. The specific virus. 2. Increased activation of virus. 3. Susceptibles. 4. A horde of healthy carriers with constant mixing of population.

Result.—An epidemic of poliomyelitis lasting until all susceptibles have had the disease or the virus has lost its high virulency.

* * *

TREATMENT

GEORGE E. EBRIGHT, SAN FRANCISCO.—From the study of the epidemics of poliomyelitis in California in 1925, 1927, 1929 and 1930, I am of the opinion that the unrecognizable healthy carrier is the largest factor in the transmission of the disease and that the adult carrier is more a factor than the juvenile carrier.

It is very probable that the adult more often than the child can harbor the active virus in the nasopharyngeal secretions and not be made ill thereby.

Observations throughout California in 1927 showed that the opening of public schools in the late summer had no influence in checking the recession of the epidemic then waning. In August, 1930, the thousands of children who, on hot days, thronged the ocean beaches for a hundred miles caused no increase in the number of cases reported.

However, active cases should be quarantined and contacts should be isolated, although when the contacts are wage-earners, in the present lack of more certain knowledge of the transmission of the disease, too rigid measures of isolation cause more privation than is justifiable.

Certain definite fallacies should be combated because they activate a deplorable state of panic in the public mind:

1. Swimming pools should *not* be closed on account of poliomyelitis, nor should any other healthful outdoor exercise be curtailed. There is no evidence that the congregation of children about swimming pools or bathing beaches spreads the disease. The evidence is to the contrary. There is no satisfactory evidence that the virus remains active in the water of swimming pools. By far the most of the pools in California are chlorinated and the water contains more than enough free chlorine to rapidly destroy the virus of any disease. This has been brought about by the law and by public sentiment.

2. Schools should *not* be closed on account of poliomyelitis. This dictum may be based on the observations of the State Board of Health in the 1927 epidemic. Moreover children are under better supervision in schools than on the streets, and the indisposition of individuals more quickly recognized.

Individual Treatment.—Early diagnosis, early hospitalization, rest in bed, and early treatment with immune serum and after-care enable much more to be now accomplished than ever before.

Any indisposition with fever that cannot be readily explained should lead to the suspicion of poliomyelitis, especially during an epidemic. Headache, tenderness or stiffness of the neck and back muscles with paresthesias of the trunk or limbs are some of the indications for a spinal puncture which will disclose a clear spinal fluid with an increased cell count. A child in the preparalytic stage does not like to be moved. It hurts. The neck hurts. The neck may be quite stiff. The back may be sensitive. Sometimes these things do *not* happen, but they should not be overlooked.

Acute diarrheas arouse suspicion, also unaccountable nausea or vomiting should lead to a critical examination of the central nervous system.

Children who have been definitely exposed should be carefully watched for two or three weeks. It is known that the incubation varies.

Aycock and Luther[1] in experimental poliomyelitis in monkeys with unmodified serum demonstrated incubation from three to sixteen days and with modified serum as long as twenty-six days.

Once the diagnosis is made, convalescent serum should be given intramuscularly at once, 500 cubic centimeters to a child and 100 cubic centimeters to an adult. This is by far best given in the preparalytic stage, but should be given even if paralysis has supervened.

Intrathecal dosage may be used but *not more than once.*

The usual precautions against anaphylaxis should be observed, although human serum does not so often cause trouble as does horse serum.

Results of Treatment with Convalescent Serum.—Series one:[2] 1083 untreated cases, 165 deaths, case fatality rate 15.2 per cent; 106 treated cases, one death, case fatality rate 0.9 per cent.

Series two:[3] Seventy-four patients given serum in preparalytic stage, no deaths. Residual paralysis 6.7 per cent. Eighty-seven patients not given serum in preparalytic stage, seventeen deaths or 19.5 per cent. Residual paralysis in forty-nine or 52.3 per cent.

REPORT OF A CASE

Mrs. X—age 45—housewife. Good surroundings. Excellent general health.

Present illness:

August 3, 1930.—Five or six loose stools—no fever.

August 4.—Slight back pains.

August 5.—Increased pains in back.

August 6.—Severe headache—pains in neck and back radiating to front—no fever—definite chill in evening.

August 7.—On examination: Very severe headache—severe pains in neck and back radiating to front. Chest and abdomen, thighs and legs feel numb. Temperature 100.2 to 101.6, pulse 100. Respirations 20-25. Neck very spastic, flexion of neck causing severe pain in neck and back. No Koenig. Normal eye and tendon reflexes. Retinae negative. Visceral organs negative. Spinal fluid clear, normal pressure, cell count 143 per cubic millimeter, chiefly polynuclears. Search for meningococci negative.

August 8.—Condition unchanged except increased stiffness of neck; headache very severe. Convalescent serum obtained and 20 cubic centimeters given into gluteal muscles. In two hours pains in neck and back disappeared and the headache was completely relieved. A few hours later 30 cubic centimeters of the serum were given. (It would have been better had 100 cubic centimeters as an initial dose been given.)

The following day patient felt perfectly comfortable, headache, backache and neck pains and paresthesias of limbs had disappeared since the administration of serum. The temperature, which had ranged from 100.2° to 101.6°, remained at 100, and by the third day following came to normal by lysis. The pulse dropped from a rate of 80 to 90, to 70. Respirations that had ranged from 20 to 25 per minute, dropped to 20. These changes to normal in pulse and temperature took place within a few hours after serum administration. Recovery was complete in five days.

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* * *

PROPHYLAXIS

MARK L. EMERSON, OAKLAND.—Infantile paralysis is rather a misnomer because adults as well as infants are likewise affected, and a very small percentage of the probable patients have paralytic symptoms. Better to call it poliomyelitis.

Looking over the spot map of California where poliomyelitis has appeared during the past few months, the highest average goes to the south. However, the rate in the north may be raised during the next few months.

In Alameda County we try to send all suspected as well as active cases to the Isolation Ward of the Baby Hospital and allow experts to handle such cases. This does not prevent the family doctor from handling the case if he wishes to. Tapping the spine will probably give first authentic information. Serum from convalescent patient is our best treatment at present; therefore, get your patient where serum is obtainable, as the supply is necessarily limited and should be reserved for proved cases and not wasted as a prophylactic measure on suspected cases. Doctors call for the serum in order to have it on hand in case future symptoms warrant its use. It is desirable to have the patient in the hands of those who are familiar with handling the same.

Two very good articles on this subject appeared in the last issue of CALIFORNIA AND WESTERN MEDICINE. The same prophylaxis applies to poliomyelitis as to any other communicable disease.

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Leaflet Regarding Rules of Publication.—California and Western Medicine has prepared a leaflet explaining its rules regarding publication. This leaflet gives suggestions on the preparation of manuscripts and of illustrations. It is suggested that contributors to this journal write to its office requesting a copy of this leaflet.

EDITORIALS

A STATE ELECTION YEAR—NEW REAPPORTIONMENT IN THE CALIFORNIA LEGISLATURE

This Is a State Election Year.—All do or should know that this is a state election year. The recent primary election was held in August and the candidates representing the different political parties have now been nominated and await the final decision of the citizens of California, which will be rendered in the November election.

* * *

Proper Maintenance of Public Health Standards Is a Civic and Medical Responsibility.—The members of the California Medical Association and their official journal, CALIFORNIA AND WESTERN MEDICINE, are not interested in political parties or in the representatives of political parties, as such. They are, however, very much interested in the attitude which elective executive and administrative officers hold toward public health problems.

Members of the medical profession cannot escape their special responsibilities in the maintenance of proper public health standards. A foundation principle in good citizenship in a republican form of government makes it obligatory for every citizen to offer to the state the best judgment and efforts of which he or she is capable, in so far as the maintenance of governmental standards having to do with the general welfare are concerned.

Medical men and women are by their training specially fitted to give superior or expert advice on the solution of public health problems. Such counsel, when given by experienced physicians to lay executives or legislators who may be holding civic positions should not fall on indifferent, unwilling or antagonistic ears. To that extent, therefore, physicians should make it their business to know somewhat of the viewpoints of candidates for public office, and to sound out such candidates as to their general attitude on public health problems of California, so that, if possible, only such candidates shall be elected to office who will give loyal support to desirable public health measures.

Such interrogation of candidates can be best done through properly constituted public policy and legislation committees of county and state medical societies, these committees in turn communicating the results and impressions obtained in such conferences with candidates, to the members of their respective societies, so that individual physicians and the friends of physicians may be placed in better position to exercise wise judgment in the selection of the candidates for whom they will cast their votes.

It is not necessary for such committees, in every instance, to espouse the candidacy of one particular candidate for each office. Where candidates with proper backgrounds and creditable past records aspire to the same office, committees on public policy and legislation can very properly state that each such candidate is acceptable, leaving it to individual medical friends of each such candidate to give such special support as under the circumstances might seem warranted, if that should be deemed necessary or desirable.

In all this work, committees on public policy and legislation should make a special effort to refrain from improper partisanship, for partisanship is only permissible under special conditions. That is, special partisanship for one candidate may be justified, when the opposing candidate has a record of real or very probable antagonism to the maintenance of proper public health standards. The reasons for such antagonism it is not necessary to emphasize, or to specially dwell upon. It is enough to know that a certain candidate is opposed, for this, that or the other reason, to sane public health legislation and administration. That fact once properly established, then such a candidate should not receive the suffrages of members of the medical profession or of those lay citizens holding viewpoints on public health that are in general accord with those held by physicians.

* * *

The New Senatorial and Assembly Reapportionment.—Members of the medical profession belong to one of the learned professions and because of special scholastic training are assumed to have an understanding of citizenship and gov-

ernmental responsibilities that measures up to or is better than the average possessed by citizens who may have been less fortunate in preliminary education. Nevertheless (probably because of the many other serious health and life problems constantly demanding the attention of physicians in their daily work), it is a question whether physicians by and large, as a guild group, keep themselves thoroughly alert on civic matters.

For instance, it would be interesting to know how many members of the California Medical Association still remember or are aware of the fact that at the last state election on November 6, 1928, a referendum creating certain changes in California senatorial and assembly districts was presented, the same having been submitted by the Forty-eighth California Legislature, and the people voting that the provisions therein contained should be enacted into law.

In the "public policy and legislation" column of the Miscellany Department of this issue of California and Western Medicine are printed the reapportionment changes which were then made in senatorial and assembly districts. Perhaps the most important change has to do with the state senate, for no one county is now permitted to have more than one state senator, and all except a few of the very small northern counties have each one such senator, the very small population counties being divided into eleven groups of twos and threes, each of such groups having a state senator.

* * *

The Senatorial District Set Up Is Similar to That of the House of Delegates of the California Medical Association.—It is somewhat of a curious coincidence that the charters of county medical societies, as applied to county units consisting of two or more smaller county groups, which have been in operation for years in the California Medical Association, approximate somewhat the same arrangement as was adopted by the people of California only two years ago for civic government. Indeed, one state senatorial district, namely, that consisting of Mono and Inyo counties, finds our state medical association altogether unrepresented through a component county society. Readers who are interested in studying such a comparison for themselves, can do so by comparing the list already referred to, and which is printed in this issue, with the make-up of the California Medical Association House of Delegates as printed on page 269 of the April, 1930, issue of California and Western Medicine.

The significant feature of the senatorial phase of the 1928 reapportionment lies in this, that the Assembly, which is composed of members apportioned on the basis of population, will not be able to dominate in legislative matters. That is, the larger cities and centers of population in California will not be able to dominate future legislation through excess of representatives in both houses of the legislature, because all Assembly resolutions must receive the approval of the Senate before being passed on to the Governor for further approval and enactment into law.

It may be asked, what has all this to do with organized medicine and the maintenance of public health interests? Just this, that the smaller component county medical societies of the California Medical Association are now in the position, for the first time, where they will be able to exert what might be termed an even greater influence on prospective public health legislation than will the larger county medical societies (including cities such as San Francisco, Los Angeles, Oakland and Sacramento).

* * *

Smaller County Medical Societies Can Render Efficient Service.—Fortunately for the public health interests of California, the smaller county medical units of the California Medical Association are, as a class, quite well organized. In these smaller counties, moreover, the physicians occupy a peculiarly intimate and pleasant relationship with lay fellow citizens. This personal knowledge and contact with senatorial candidates can therefore become a most valuable aid to the California Medical Association committee on public policy and legislation. These thoughts are presented by the editor to call attention to this new development in our political and civic adjustments, and to urge our smaller county medical societies to be alert to the new responsibilities which now rest upon them.

* * *

County Society Committees on Public Policy and Legislation Should Be Active.—As has been so often stated in this column, every component county medical unit of the California Medical Association should have an alert and at this particular time, an actively working committee on public policy and legislation, to watch not only its own jurisdiction, but to maintain active relationship in state-wide endeavors with the standing committee of the California Medical Association. If our county units through their officers and committees, will take an immediate interest in the matters here outlined, the work and worries of the officers of the California Medical Association will be much lighter, and also more satisfactory during the session of the Forty-ninth Legislature, which will convene at Sacramento on January 2, 1931, than has been the case in past years. A comparatively small amount of intelligent effort exerted before the final election in November next, may give public health legislation a much better background in January, 1931, than has been noted in many recent legislative sessions. The ends to be attained more than warrant such intelligent interest and coöperation, and it is hoped that every county medical society in California will do its full part.

WOMAN'S AUXILIARY OF THE CALIFORNIA MEDICAL ASSOCIATION

History of the Auxiliary Movement in California.—The question—whether the California Medical Association would benefit from the establishment of a Woman's Auxiliary—was discussed by the Council of the California Medical Association for several years before sanction was given for the organization of such a state auxiliary. The Council then instructed one of its committees to submit to it, rules of government for such an auxiliary; and later, at the San Diego annual session on May 7, 1929, under the sponsorship of the Council, the Woman's Auxiliary of the California Medical Association was organized in formal fashion. True, that organization was only a preliminary or what might be called a foundation or initial paper organization. Yet, as so formed, the Woman's Auxiliary of the California Medical Association came into being in quiet but efficient manner, as is evidenced by the somewhat remarkable growth which has since taken place in certain counties (see August CALIFORNIA AND WESTERN MEDICINE, page 619).

Following the regular procedure of allocating for general supervision every phase of organization work to one of the standing committees of the California Medical Association, the Council subsequently assigned to the Committee on Associated Societies and Technical Groups, the responsibility of aiding in the further development of state and county auxiliaries. That committee felt that it could promote such development to best advantage in the various counties, if a leaflet were printed, in which could be presented the rules of organization which had been adopted by the Council; and in which would be indicated the best and easiest methods of procedure for establishing county auxiliaries, after plans which had been previously outlined in the editorial columns of CALIFORNIA AND WESTERN MEDICINE. The Council authorized the standing committee to compile such a leaflet, and therein were also given lines of social, philanthropic and educational activities, these having been gathered from the publications of the national woman's auxiliary (Woman's Auxiliary of the American Medical Association).

In passing, it may be stated that the national organization came into existence in 1922, as an outgrowth or development of the Texas Woman's Auxiliary, which was organized in 1919, that first state auxiliary in turn having come into being as a result of the formation of the first local woman's auxiliary in Dallas, Texas, in 1917.

Copies of this leaflet were sent from the central office of the California Medical Association to the officers of every county medical society in California, with the request that each county society aid in the organization of a local county auxiliary. The officers of the State Auxiliary who were elected at San Diego also rendered efficient aid in this effort. An educational campaign was also carried on through editorial comment, and through news items in a special column of CALIFORNIA AND WESTERN MEDICINE. These various efforts, combined with those of the state auxiliary officers who were elected at San Diego, resulted in the formation of eleven county auxiliaries in the first year of the California State Auxiliary's existence, with a total paid up membership of something like 675 members. This was certainly an excellent beginning and those achievements may be taken as an indication that the auxiliary movement in California will continue to grow.

* * *

County Medical Societies Are Again Urged to Form Woman's Auxiliaries.—The officers of all the component county medical societies of the California Medical Association, in which no auxiliaries as yet have been organized, are again urged to give this matter their consideration and support. The auxiliary leaflet which has been published gives full instructions as to best methods of procedure. It is suggested to all who are interested in prospective organization that the central office of the Association be written to with a request for such number of copies of the leaflet as may be desired. By following this method, the formation of a county auxiliary becomes a comparatively simple matter.

The California county auxiliaries which have been formed to date, already have given much pleasure to their members. As time goes on, these auxiliaries may be counted upon to give expressions of increasing service, not only to the members of the auxiliaries, but to the interests of the medical profession and also to the public health and to the general welfare of the communities in which they are established.

As to the future of the different auxiliaries, that naturally will depend in good part upon the membership and upon the officers and committees who are chosen to take the leadership in the various phases of auxiliary work.

* * *

Some Suggestions on Fundamental Procedures. If we were at this time to stress some of the important matters which each auxiliary should observe, our tabulation would include items such as the following:

1. The fundamental rules of government of procedure for each auxiliary should and must be those authorized by the Council of the California Medical Association, and as printed on pages 4, 5 and 6 of the "California Medical Association Auxiliary Leaflet." Any additional rules which might be adopted by an auxiliary must not be in conflict with these rules which were approved by the Council of the California Medical Association.

2. The officers and members of each county woman's auxiliary should keep constantly in mind that by the basic rules, the contact committee representing the local county medical society is stipulated to be the president, the vice-president and secretary of each such county medical society. The executive officers of each county auxiliary should maintain proper contacts with this advisory committee which has been provided to represent

each county medical society. All matters of policy, when of possible delicate or intricate nature, should be presented to the medical advisory committee for opinion. This provision contemplates an arrangement whereby a county auxiliary shall carry on most of its county work, as a county rather than as a state function, and in full coöperation with county medical society officers.

3. Special care should be constantly taken, that no officers or members of an auxiliary speak in the name of the local county medical society or of organized medicine, except as express permission may be granted in specific instances by the medical advisory committee.

4. The social meetings would naturally be in line with the inclination of local members. Non-expensive types of entertainment, safeguard against many dangers to the treasury and to other organization interests.

5. Auxiliary members who also hold membership in different woman's clubs and organizations, can render the very best of service by taking a real and active interest in all activities of such various woman's clubs and organizations which trench on the domain of public health. In short, members of Woman's Auxiliaries should occupy positions of leadership in all public health activities of such extra-auxiliary woman's organizations. Few types of service can be made to be of more value than this.

6. The public health program or studies to be carried on by each auxiliary should reflect matters existing in local environments. There are a host of such problems, all of which can be studied and reported upon by a Public Health Committee and its special sub-groups or sub-committees. Among such might be mentioned: water supplies; food supplies; housing conditions; school health problems (construction of school buildings, care of undernourished children, supervision of wayward or deficient school children); tuberculosis problems; acute epidemic problems (such as infantile paralysis); city and county health departments; county hospital problems; miscellaneous clinic and health center problems; and so on.

Such a public health committee could consist of say five to ten members, each of whom in turn was chairman of one or more special sub-committees of three or five other members of the auxiliary, to investigate one or more of such problems as are above enumerated.

7. Philanthropic activities, special study courses and similar activities are other matters worthy of consideration, but in these as in all things of growth, no set method of procedure can be laid down for all alike. The task before each auxiliary is to discern what are its local problems and then to make an effort at proper solution and betterment.

8. And finally, as regards so-called civic politics, whether of city, county or state nature, the less direct activity in such, probably the better in the long run. Here again the best course to follow can be made more easy and clear, by utilizing the services of the medical advisory committee or its designated representatives. In all this, the major thought should be of principles and service, rather than of spectacular publicity or personalities.

* * *

Woman's Auxiliaries Can Render Big Service. In conclusion, it is well to keep in mind that a woman's auxiliary is not intended to revolutionize all future activities having to do with medical or public health problems. The auxiliaries are primarily intended to provide a means of fellowship and coöperative endeavor for the women members of physicians' families. In union there is strength. Busy physicians can give but little time from their regular work for these accessory public health and medical problems. A woman's auxiliary can bring to the aid of organized medicine a valuable group of intelligent women, who, through their auxiliary organization, will be in position to render splendid service to its respective community in public health, general welfare and medical problems. That being the case, it would seem that woman's auxiliaries can and will more than justify their right to existence. And as for California, the editor believes, as time goes on, that such will be the final judgment of the medical profession of this new supporting arm to the public health, medical and public welfare interests of California and its constituent counties.

Singing as a Recreation for Nurses.—Today there are so many professional and business inducements offered to young women that, if nursing is going to fill its ranks with women of the right type, thought and consideration must be given to their social as well as to their educational lives. The routine work of the nurses in training is so arduous that the nurses get through the day much easier if they can look forward to some engrossing diversion in the evening, some recreation which will not only interest and develop the individual nurse but which will raise the esprit de corps of the whole training school.

An example of one satisfactory solution to the problem of providing extracurricular activities for the nurses has been provided this winter by the Toronto Western Hospital. A choir of fifty voices, selected from the training school and under the direction of Mr. Campion Smith, the assistant director of the Mendelssohn Choir, gave its first public recital early in April. This concert was an unqualified success and proved again that music is "the speech of angels."

The director of the work is convinced that one of the many advantages which should result from the formation of this choir, and possibly the greatest, will be the opportunity afforded to develop voice culture. He is of the opinion that this subject has been sadly neglected in many training schools and that we are all prone to forget, both nurses and doctors, that a soft, carefully modulated musical voice may do almost as much to soothe the irritable and nervous patient as many of our therapeutic measures. We are inclined to agree with Mr. Smith.

Like dramatics, singing and other forms of music create a decidedly cultural atmosphere in the training school, a desideratum sometimes difficult of attainment in the hurry-skurry routine of practical life. Group-singing, as an extracurricular activity, might well be taken up by training schools all over the country, and we look forward to the near future when nurses' choirs will be a feature of hospital and nursing conventions, as was the singing of the Danish nurses at the International Convention of Nurses held a few years ago at Helsingfors.—*The Canadian Medical Association Journal,* August 1930.

MEDICINE TODAY

This department of California and Western Medicine presents editorial comment by contributing members on items of medical progress, science and practice, and on topics from recent medical books or journals. An invitation is extended to all members of the California Medical Association to submit brief editorial discussions suitable for publication in this department. No presentation should be over five hundred words in length.

Dermatology

Toxic Reactions Produced by the Application of Trinitrophenol (Picric Acid).—One of the widely used applications in burns and various infectious skin conditions is picric acid in solutions or ointments. It is often used in industrial surgery and for sterilizing the skin preliminary to surgical procedures. Recently it was reinforced by butyn for anesthetic purposes and introduced as butesin picrate. Considering that picric acid is a derivative of phenol, the possibility of toxic effect is not surprising. The combination with butyn renders the untoward effect more likely. The writer, having an aversion and prejudice against phenol and its derivatives, never uses it nor picric acid. From time to time dermatologists see cases of local dermatitis from picric acid, but no systematic study of this subject has been reported so far.

We note, therefore, with great interest, the publication of a clinical and experimental study, by Dennie and McBride of Kansas City on the potential toxic effects of picric acid applications.

The authors have made a series of skin sensitization tests to picric acid on one hundred students. On one arm an area of two centimeters square was painted with five per cent alcoholic solution of trinotrophenol; on the other arm, a similar area was painted with five per cent aqueous solution of tannic acid. There were no reactions to the tannic acid, but four per cent of the patients showed positive reactions to the trinitrophenol, two reactions being severe and extending far beyond the area of application.

They concluded that dermatitis occurring at a distance from the area from application was produced by a protein picrinate which was carried by the blood stream or lymphatics to these areas where it was split up into its component parts, and the trinitrophenol radical or some of its modifications reunited with epithelial cells.

The animal experiments undertaken to check up this hypothesis yielded a confirmatory evidence. Experimental subcutaneous injections in dogs have shown also that the lethal dose of trinitrophenol is between 0.1 and 0.125 gram per kilogram of body weight, and that the subcutaneous fat, even at points removed from the area of injection, is stained yellow. The lungs are often stained yellow. The dog's skin does not have nearly the same ratio of absorption as the skin of a human being, since it has no sweat glands. Fifty cubic centimeters of a five per cent alcoholic solution of trinitrophenol was applied to the intact skin of the dog. The blood showed a positive reaction for trinitrophenol after twenty-four hours. Tests for trinitrophenol in blood of human beings who have received applications of trinitrophenol would be positive. They consider the application of a solution of trinitrophenol to burned or abraded skin dangerous even for nonsensitive persons, since many deaths have been reported from its application.

In conclusion, Dennie and McBride advised against the use of trinitrophenol to sterilize the field of operation and recommend the substitution of tannic acid in proprietary ointment cases.

M. Scholtz, Los Angeles.

REFERENCE

Dennie, Charles and McBride, William. Arch. Dermat. and Syph., 20, 698, 1929.

Orthopedics

Prevention of Contractures in Poliomyelitis. The prophylaxis of contractures. This is the predominant physiological task in the treatment of infantile paralysis. Contractures are so frequent a complication that they are considered as a *sine qua non* in poliomyelitis. They are preventable and must not be allowed to occur. Contractures develop in virtue of two factors: weight bearing, and physiological tonus and contractions of the healthy muscle opponents. Both factors effect an overstretching of the paralyzed muscles and exert a detrimental influence upon them.

The formation of contractures where weight plays its part is demonstrated by the equinus deformity whenever the tibialis muscles are paralyzed and the foot allowed to hang down by its own weight or by the weight of the bed clothing while the patient is recumbent. The calf muscles shorten and develop a permanent contracture.

Flexion deformities due to paralysis of the extensors and to contractures of the flexor group of muscles is the rule in the lower extremities. Flexion contractures of the hip, the knee, and the foot, plantarily, are the common malformations. In the upper extremities the predominant crippling disability is adduction contractures of the arm and, less frequent, the drop wrist. All this crippling can and must be forestalled by the proper splinting as a preventive measure in the early period of the disease. Postures to be adhered to are: The hip in alignment with the body on a Bradford frame; the knee in extension on a plaster trough or any type of posterior splint; the foot at right angle, with the leg on an appro-

priate device; the hand extended or dorsally flexed on a cock-up support and the shoulder on an aeroplane or abduction splint.

Not only muscles of the extremities may be affected, but those of the trunk may also be paralyzed. In such cases it is essential to keep the patient on a Bradford frame or a plaster of Paris bed until such time as he is able voluntarily to sit erect. The formation of scoliosis in these patients is so obvious and the restoration of this type of spinal deformity so difficult and time-consuming that the rule to have the patient in the recumbent position must be adhered to strictly for a considerable length of time. Better to err by extending the number of months of recumbency and of physiological posture of the joints than to regret the formation of deformities by soft tissue contractures.

A. GOTTLIEB, Los Angeles.

Psychiatry

Importance of Mental Facts in Medicine.—General hospital histories always emphasize physical facts, but obvious mental facts are rarely mentioned. Indeed I have never seen mental facts stated in an understandable or complete manner in these histories. My plea is that both mental and physical facts are important, and that neither alone completely presents the case for study.

In a recent study of three hundred general hospital histories the author states the following conclusions:

1. Among the unmistakably psychoneurotic cases only 8 per cent had been so diagnosed in spite of an average disease duration of five years.

2. Only one of the three hundred histories showed a full psychiatric presentation.

3. Among the initial complaints recorded, only 2 per cent suggested the real mental motivating facts while the psychiatrist found such mental motivating facts in 90 per cent of the complaints as stated by the patients. Usually the doctor had recorded what he thought the patient ought to say. The patient's description of the beginning, course, and present status of the complaints is easily obtainable and most important. The doctor should also record a statement as to the personality type, and credibility of the patient, as a background for the disease picture. While this is unusual it is not difficult or impossible.

Personality begins with the hereditary facts and grows in a family situation called the environment. From the hereditary point of view our chief interest is in the possible neuropsychiatric defects such as psychoses, neuroses, alcoholism, epilepsy, instability, nervous explosions, etc. Individual potentialities are usually evident in previous family records, but we are most interested in unfavorable possibilities. Confidence is never established on the first inquiry, and many important facts come later. The family situation will indicate social opportunities, educational facilities, and whether the family group is complete or broken.

In recording the life growth history one must indicate the continuity of growth with reference to the average expectations of the different age levels. In this manner we shall not find contradictions, but a connected consequential line of growth which Adler calls the "life line." Skill in interpretation comes with experience and is never based on single behavioristic facts such as a facial expression, a timid response, or an irritated manner. One should describe what he really sees without prejudice, and let the personality facts themselves form the picture.

The first or infant stage shows the pure ego reactions irrespective of any feelings of environmental associations. Thus one sees more clearly the sensitive, the egoistic, the fearful, the expanding, the explosive, the withdrawing types in their relations to food, to attendants, to sudden noises, or to fear of falling. On the other hand the times of beginning of purposeful movements, speech, walking, control of bladder and bowel indicate normal or delayed mental growths.

At three years one finds the smaller family group reactions and at six the larger school reactions. Meanwhile sex interests remain purely family and biological under normal circumstances. At twelve to fourteen years one finds personal sex interest which should normally tend toward its heterosexual aim. These are the normal growth features which make or mar subsequent personal attitudes. Pathological things such as diseases, accidents, operations, the general habits, and places of residence—these are of interest in their effects upon personality as well as their possible physical handicapping.

Adolescence reaches a climax in the solution of the two final problems of occupation and mating. It is then that the two main defects of growth, viz., feeble-mindedness and psychopathic personalities, become most important and evident. No history is complete without some indication of how these two main issues are met.

Finally the history must recognize and describe a psychoneurosis as such and not bury it under physical medical facts. A psychoneurosis is a definite clinical entity. Medicine cannot afford to ignore a psychoneurosis or hide it behind physical facts, or stifle complaints by means of sedatives. But when the above essential facts are recorded the average doctor will not blunder or refuse to seek special help when such is indicated.

ROBERT L. RICHARDS, San Francisco.

A Cancer Class for Doctors.—Plans to assemble one thousand physicians in the largest postgraduate cancer class ever held were announced today at Johns Hopkins University. The course is designed to meet new conditions in cancer prevention caused by a marked increase in the number of persons seeking medical advice. It is announced by Dr. Joseph Colt Bloodgood for September 15, 16, and 17. Invitations are to be sent to several thousand physicians, surgeons, and radiologists and are issued by the Garvan Experimental Laboratory and the Copley Surgical Pathological Laboratory of Johns Hopkins. Coöperation is announced of the American College of Surgeons and of the Chemical Foundation.—*The New York Sun*, July 31, 1930.

STATE MEDICAL ASSOCIATIONS

CALIFORNIA MEDICAL ASSOCIATION*

LYELL C. KINNEY ..... President
JUNIUS B. HARRIS ..... President-Elect
EMMA W. POPE ..... Secretary

OFFICIAL NOTICES

Next Council Meeting.—The next meeting of the Council of the California Medical Association will be held on Saturday, September 27, at 10 a. m. in the Indian Room at the Ambassador Hotel, Los Angeles.

* * *

Clinical Prizes — Rules for the Submission of Papers.—1. Any member of the California Medical Association is eligible to compete for the prizes. Any question arising as to the eligibility of a candidate or the admissibility of his essay will be settled by the decision of the Council.

2. Manuscripts must be typewritten on one side of the paper; they must be double spaced; and they must not be folded or rolled. Illustrations or charts must be marked with the title of the paper to which they belong.

3. Essays must not contain more than four thousand words. In judging a paper the committee will take into account the basic importance of the work done and its novelty; the thoroughness with which the research has been carried out; the clearness with which it has been written up; and the neatness of the manuscripts and illustrations.

4. Papers should be sent, preferably by registered mail, to Dr. Emma Pope, secretary of the California Medical Association, 1016 Balboa Building, San Francisco. They should be identified by a nom de plume or motto only. A separate envelope should be sent to Doctor Pope containing the author's name and his nom de plume or motto, so that after the award is made the name of the writer can be found. Any return addresses or distinguishing marks will be removed from the wrappers before the papers are turned over to the judges.

5. All papers must be in the hands of Doctor Pope **before February 15,** in order that the judges may finish their work in time for the meeting of the Association. Those entered for presentation at annual meeting also, must be sent in by **December 20.**

6. All papers entered in the Clinical or Research Prize Contest are eligible to be read at the annual meeting of the California Medical Association, provided the paper is received by the state secretary **before December 20** of the year preceding the annual meeting and approved by the Program Committee.

7. The judges reserve the right to withhold the award, in the event that no paper comes up to the standards of excellence they feel should be set.

8. If, in the judgment of the editors of CALIFORNIA AND WESTERN MEDICINE, and the editorial councilors, the paper on laboratory research is too technical or otherwise unsuitable for inclusion in CALIFORNIA AND WESTERN MEDICINE, the prize winner will be allowed to publish it in some special journal and will be required to make an abstract for the readers in California.

9. Inquiries relative to the prize contest should be addressed to the chairman of the committee, George Dock, M. D., 94 North Madison Avenue, Pasadena, California.

* * *

Rules Governing Papers Entered for Prize Competition and Also for Place on Annual Programs.—Send two copies of your paper to the state secretary, 450 Sutter Street, San Francisco, **before December 20,** with an unsigned note that you wish your essay submitted for a prize, and also read at the annual session. Sign your paper with your nom de plume. Also send your name in a sealed envelope with the nom de plume appearing on the outside. Use no stationery that in any way reveals your identity.

The state secretary shall deposit all nom de plume envelopes in a safe until the Prize Committee has made its decision.

The state secretary on receiving a prize paper which is submitted for presentation at the annual session shall submit said paper to the members of the Program Committee. The Program Committee will approve or disapprove it for place on the annual program. The Program Committee will inform the state secretary of its decision, and the secretary will then forward the titles of approved papers to the appropriate section secretary with a simple statement that the paper is acceptable for a place on the program. The Prize Committee will not be informed of this decision and action. A paper may be acceptable for a prize and not for a program, and vice versa.

The Prize Committee shall receive all papers which have been sent to the state secretary, whether approved for publication or not, on or before February 15. The sealed written report of the Prize Committee shall be submitted to the state office before March 1.

The Executive Committee, at the first meeting after March 1 of a given year, shall open the nom de plume envelopes and furnish the secretary the proper names of the authors for the published annual program.

The Council shall consider the report of the Prize Committee at its first meeting of the annual session, and shall announce the result at the first general meeting of the Association.

* * *

Extension Lecture Service.—With the termination of the vacation season, county medical societies renew their usual meetings and also their calls upon the state office for speakers at their monthly gatherings. So it comes about that the yearly extension lecturers are asked to revise their programs and to be prepared to furnish talks other than those previously listed.

An invitation is also yearly extended through these columns for volunteers in this work. The service is voluntary; there is no state fund to cover the expenses of travel; it often takes a member away from his work at an inopportune time, and yet those who give of their time and service make new contacts that are worth while, learn to address audiences easily, and are forced to rapid thinking and response in the discussion that regularly follows papers. Few members who have been placed upon the extension list have asked to have their names removed. Many have spoken with pleasure of their evenings with county societies.

This is fine organizational work. An active county society is the basis of a healthy state association. Whatever, therefore, calls out the members to a county meeting is an aid to the growth of the California Medical Association.

Will those members who are interested in this work and who have talks that are worth while to the

* For a complete list of general officers, of standing committees, of section officers, and of executive officers of the component county societies, see index reference on the front cover, under Miscellany.

general practitioner, and who are willing to be called upon occasionally to deliver these addresses to county societies, furnish their names and the subjects of their talks to the state office before the 20th of September?

COMPONENT COUNTY SOCIETIES

SANTA BARBARA COUNTY

The regular meeting of the Santa Barbara County Medical Society was held at the Bissell Auditorium of the Santa Barbara Cottage Hospital on Monday evening, August 11, with Doctor Freidell, president, in the chair.

The minutes of the previous meeting were read and approved.

Doctor Elliot gave a paper on "The Mechanism in the Production of Nephritis." This was discussed by Doctor Nuzum.

Dr. Ira Hiscock, associate professor of public health at Yale University, then gave a brief résumé of the survey of the Social Service Conference. This was briefly discussed by Doctors Nuzum and Henderson.

Dr. W. H. Eaton gave a report of "Local Labor Union Contract for Medical Care," which was discussed by Doctors Spaulding, Henderson, and Nagelmann.

The society then went into executive session. The transfer card of Dr. Fred T. Foard was read and it was moved by Doctor Ryan, and seconded by Doctor Means, that Doctor Foard be admitted into membership.

* * *

IN MEMORIAM

The following resolution regarding the death of Doctor Soper was read, and it was moved, seconded and carried, that the resolution be adopted and spread upon the minutes of this meeting, and a copy sent to Mrs. Soper:

Whereas, Dr. Alexander C. Soper, Jr., was for many years a respected member of the Santa Barbara County Medical Society, serving for a number of years as its secretary; be it

Resolved, That in his untimely death the members of the society have lost a valued associate and a dear friend; and be it further

Resolved, That this resolution be spread upon the minutes of the society, and a copy sent to Mrs. Soper.

* * *

Doctor Freidell then read a communication from the morning press in which they desired to publish a series of syndicated articles concerning the medical profession. After a brief discussion it was moved, second and carried, that the secretary be instructed to ascertain from the secretary of the California Medical Association whether this procedure would be ethical.

WILLIAM H. EATON,
Secretary.

CHANGES IN MEMBERSHIP

New Members

Glenn County.—Ermanella C. Coffey, Stanley E. Coffey.

Los Angeles County—Charles Seward Ambrose, Paul Revere Burroughs, E. L. Wemple.

Sacramento County—Maurice A. Hopkins, Elmo Alexander.

Transferred

Glenn T. Logsdon, from San Diego to Los Angeles County.

Deaths

Finney, Clara Eugenia. Died at Modesto, August 17, 1930, age 47 years. Graduate of Stanford University School of Medicine, San Francisco, 1920. Licensed in California, 1920. Doctor Finney was a member of the Stanislaus County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

Herbert, Gavin Shearer. Died at Hollywood, August 11, 1930. Graduate of University of Illinois College of Medicine and Surgery, 1909. Licensed in California, 1914. Doctor Herbert was a member of the Los Angeles County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

Jump, Robert L. Died at Oakland, June 16, 1930, age 66 years. Graduate of Cooper Medical College, San Francisco, 1890. Licensed in California, 1890. Doctor Jump was a member of the Alameda County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

Kearney, Percy Francis. Died at San Francisco, August 11, 1930, age 52 years. Graduate of University of Minnesota Medical School, Minneapolis, 1904. Licensed in California, 1923. Doctor Kearney was a member of the Alameda County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

Lowell, Charles Herbert. Died at Carmel, July 30, age 55 years. Graduate of Cooper Medical College, San Francisco, 1896. Licensed in California, 1896. Doctor Lowell was a member of the Monterey County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

Thompson, Charles Elliott. Died July 28, 1930, age 60 years. Graduate of Cooper Medical College, San Francisco, 1894. Licensed in California, 1894. Doctor Thompson was a member of the Los Angeles County Medical Association, the California Medical Association, and the American Medical Association.

UTAH STATE MEDICAL ASSOCIATION

H. P. KIRTLEY, Salt Lake City.....President
WILLIAM L. RICH, Salt Lake City.....President-Elect
M. M. CRITCHLOW, Salt Lake City.....Secretary
J. U. GIESY, 701 Medical Arts Building,
Salt Lake City.....Associate Editor for Utah

OFFICIAL NOTICE

The Utah State Association and its Committee on Program has every reason to be congratulated on the list of guests who will attend the state meeting in September.

The list is imposing enough to inspire anticipations of the highest and assure a program of unusual interest.

Dean Lewis of Johns Hopkins, Baltimore, will be with us. William Gerry Morgan will lend us the pleasure of his presence. Leo Eloesser and Aaron Green of San Francisco will both speak. A. C. Ivy of Chicago North Western is on the program. A. Warthlin of Ann Arbor will also participate, and Anita M. Muhl of San Diego will represent the extreme southwest.

With such a promise the state meeting cannot fail to be well worth the time of each and every state member. One can only hope that the attendance will justify the efforts made by the committees in gaining the support and coöperation of such speakers as these.

Programs are being mailed out the second week in August, and the Committee on Publicity will see that the meeting is well advertised.

This year there will be no postgraduate classes, the entire scientific program being carried as a part of the state meeting itself.

Full accounts of the meeting will be printed in the October issue.

MISCELLANY

Items for the News column must be furnished by the twentieth of the preceding month. Under this department are grouped: News; Medical Economics; Correspondence; Department of Public Health; California Board of Medical Examiners; and Twenty-Five Years Ago. For Book Reviews, see index on the front cover, under Miscellany.

NEWS

Pacific Association of Railway Surgeons.—The Pacific Association of Railway Surgeons held its twenty-eighth annual meeting at the Hotel Coronado, San Diego, on August 22-23. Scientific programs were given on Friday and also Saturday morning. On Saturday evening the visiting members adjourned for other diversions to Agua Caliente, in old Mexico. On Friday there was a symposium on emergency treatment of various injuries, and a paper on fractures of the leg. On Saturday morning, following the presidential address and business meeting, there was a paper on "Compression Fractures of the Vertebrae" by Doctors Dunlap and Parker of Pasadena, and a progress report on cancer research work by Doctors Coffey and Humber of San Francisco. Most of the members of the association traveled south to San Diego in special cars from San Francisco, stopping off on Thursday at Los Angeles, where the visiting members were entertained by the Los Angeles members of the association with a barbecue dinner and other entertainment at the Uplifters' Ranch in Santa Monica Canyon.

New Homeopathic Hospital.—The regents of the University of California have reconveyed to the Hahnemann Hospital Corporation the building situated upon the corner of California and Maple streets, San Francisco, and plans are now being considered for the razing of the old building and construction of a new homeopathic hospital.

The homeopathic profession is being congratulated upon the prospects of soon having a hospital of its own.—*Pacific Coast Journal of Homeopathy,* August 1930.

Walter C. Alvarez Lecture.—At the thirty-second Annual Session of The American Gastro-Enterological Association, held at Atlantic City, New Jersey, May 6-7, 1929, Dr. Frank Smithies donated a fund with the object of the association's securing annually a guest speaker of national prominence in research work.

The proceeds of the fund assure an honorarium to the invited guest of $100. This annual address is to be known as "The Walter C. Alvarez Lecture."—*Official Bulletin of the Chicago Medical Society.*

Symposium on Benign and Malignant Lesions of Bone.—On September 15, 16 and 17, 1930, beginning Monday morning at 10 o'clock and ending on Wednesday evening at 9 o'clock, in the ballroom of the Belvedere Hotel, Baltimore, Maryland, will be held a meeting for the study of benign and malignant lesions of bone. Dr. Joseph C. Bloodgood extends an invitation to all radiologists interested in the diagnosis and treatment of bone tumors.

On account of the size of the ballroom the number must be limited to eight hundred. Those who wish to attend should write the manager of the Belvedere Hotel.

For further details address Miss Maude Walker, secretary to Doctor Bloodgood, Surgical Pathological Laboratory, Johns Hopkins Hospital, Baltimore, Maryland.

The Grace Deere Velie Metabolic Clinic was made possible through the beneficence of Grace Deere Velie, who left an endowment in the neighborhood of $800,000. Slightly over $300,000 has been expended for the buildings and equipment. The purpose of the clinic, as set forth in the articles of incorporation, is primarily to conduct investigative work in metabolism, and for the intensive study and treatment of patients suffering from metabolic diseases.

The clinic will have facilities for taking care of twenty-five patients, with complete laboratory equipment for diagnosis and research. There are five research laboratories and an animal house with laboratory and operating room in connection.

The clinic will not be conducted for profit, though it is expected that the income from care of patients will pay part of the operating expenses, leaving the major part of the residual endowment available for research.

The initial staff will consist of:

R. A. Kocher, A. B. Stanford; M. D., Johns Hopkins; postgraduate study, Munich, 1912-1914. Published numerous researches in metabolism.

Paul B. Hartley, A. B., M. D., Northwestern Medical School, Chicago, 1925. Resident St. Luke's Hospital, Chicago. Postgraduate work in metabolism, Northwestern Medical School, Chicago.

Elmer Messner, A. M. Stanford; Cand. Ph. D., University Breslau, 1928-1930, research chemist.

Doctors Rodenbaugh and Ingber, roentgenologists.

Additions to the staff are expected to be made in the future.

The clinic at Carmel will be open to the public August 10, 1930.

Western Branch of the American Urological Association.—The next annual meeting of the western branch of the American Urological Association will be held in Los Angeles, September 18 to 20, 1930.

Officers of National Board of Medical Examiners.—At the recent annual meeting of the national board, the following officers were elected: Waller S. Leathers, president; Everett S. Elwood, executive secretary; J. S. Rodman, medical secretary.

In addition to the officers, eight new members were elected for terms of six years each. Three of these are representatives of the Federation of State Boards of Medical Examiners in the United States. They are as follows: T. J. Crowe, secretary, Board of Medical Examiners for the State of Texas; J. Gurney Taylor, member of the Wisconsin State Board of Medical Examiners; and J. H. J. Upham, dean of the Ohio State University College of Medicine and member of the Ohio State Medical Board.

The remaining five members were elected at large. They are as follows: Charles A. Elliott, professor of medicine, Northwestern University Medical School; William DeB. MacNider, professor of pharmacology, University of North Carolina School of Medicine; Walter W. Palmer, professor of medicine, Columbia University College of Physicians and Surgeons; E. D. Plass, professor of obstetrics and gynecology, the State University of Iowa College of Medicine; and Charles R. Stockard, professor of anatomy, Cornell University Medical College.

The reports of the officers of the board showed an increase of approximately 10 per cent in the number

of candidates taking the examinations during the past year as compared with the year previous.

The number of state boards now recognizing the national board's certificate total forty, besides the territories of Hawaii and Porto Rico and the Canal Zone. Partial recognition is also granted the national board's examinations by England, Scotland, Ireland, and Spain.

Examinations in Part I and II were scheduled and given in forty-one centers throughout the country; there being a total of 707 candidates registered for Part I and 337 for Part II. Examinations in Part III, the clinical and practical examination, were held in sixteen centers in June and July, with approximately 280 registered candidates.

Annual Award for Study of Goiter.—At the recent meeting of the American Association for the Study of Goiter at Seattle, Washington, Dr. William F. Rienhoff, Jr., of Johns Hopkins University, Baltimore, Maryland, received the annual award of $300 for the best essay dealing with the goiter problem. Doctors O. P. Kimball of Cleveland, Ohio; E. P. and D. R. McCullagh, Cleveland Clinic Foundation, Cleveland, Ohio, and Robert P. Ball of University of Louisville received honorable mention.

John Phillips Memorial Prize.—The American College of Physicians has announced the John Phillips Memorial Prize of $1500 to be awarded for the most meritorious contribution in internal medicine and in sciences contributing thereto. The thesis must be based on published or unpublished original work and mailed to the executive secretary of the college on or before August 31, 1930; it must be in English, in triplicate, typewritten or printed, and the work on which it is based must have been done in whole or in part in the United States or Canada. The recipient of the prize would be expected to read the essay at the next annual meeting of the college. Announcement of the prize will be made not later than two months before the annual meeting; the college reserves the right to make no award of the prize if a sufficiently meritorious piece of work has not been received. It is a memorial to Dr. John Phillips, who lost his life in the Cleveland Clinic disaster last year. The executive secretary of the college is E. R. Loveland, 133-135 South Thirty-sixth Street, Philadelphia.—*Journal of the Association of American Medical Colleges,* July 1930.

Department for Medical History at Johns Hopkins University.—Joseph S. Ames, LL. D., president, recently announced a gift from the General Education Board, totaling $312,500, for the establishment of a department of the history of medicine. The sum is in addition to $750,000 previously given to build the William H. Welch Medical Library and $250,000 for the maintenance of the professorship in the history of medicine which is occupied by Dr. William H. Welch. The gift is given in the form of $12,500 for each of five years and then a capital sum of $250,000, making possible provision for other professorships in the department of the history of medicine. Since the library was first planned, it is reported, it has been the wish of the authorities at Johns Hopkins to create a full department to investigate the various branches of medical history.—*Journal of the Association of American Medical Colleges,* July 1930.

Board of Medical Examiners.—The issuance of fifty licenses to applicants during June brought the total number of licentiates operating under the jurisdiction of the Board of Medical Examiners up to 11,417. This total was reduced at the end of the month, however, by the removal of the names of twelve deceased licentiates from the roster, leaving an actual total of 11,405 licentiates at the close of the fiscal year.

Investigations conducted by agents of the board during the period dealt with here numbered fifty and there were thirty-one investigations pending completion at the close of the period. Prosecutions conducted numbered five. Three convictions were obtained. Four prosecutions were pending completion at the close of the month. Fines assessed by courts amounted to $150. Suspension or revocations of licenses, none.

Investigations covered a wide range of complaints of alleged offenses against the Medical Practice Act, from illegal advertising, on through the scale to selling mineral water as a curative, illegal use of anatomical material, illegal writing of prescriptions, conducting a medicine show, offering fraudulent credentials and posing as an eye specialist.—*Report to the Governor, Department of Public Health.*

CORRESPONDENCE

Subject of Following Letter: Tax Exemption for Non-profit Hospitals—Constitutional Amendment No. 6

The Editors, California and Western Medicine:

Constitutional Amendment No. 6, to be voted upon November 4, 1930, is a measure of personal interest that deserves the votes of all doctors and their patients. Their moral support will mean a great deal to this cause. The House of Delegates at the Del Monte meeting approved tax exemption of non-profit hospitals. California, standing almost alone among the states of the Union in taxing hospitals organized on a nonprofit basis, is really taxing sickness and philanthropy. City and county taxation on the buildings and funds of these hospitals increases hospital costs in some institutions as much as 58 cents per day per patient.

A non-profit hospital (of which there are about 75 in California) is one which is incorporated under the laws of the State of California as non-profit, all earnings from the hospital being devoted to the conduct of the institution. No officers, trustees, or directors receive any dividends, payment or fees for their services.

A study of the facts shows a very clear case for tax exemption. In 1929, sixty-four (reporting) non-profit hospitals gave free service to the extent of $2,634,753.95. This included free service in out-patient clinics, free and part-pay hospitalization, and educational activities. The maintenance of thirty-three nurses' training schools by these non-profit hospitals amounted to $382,000. Hundreds of medical students intern in these hospitals. In other words, these hospitals are educating, at their own expense, trained workers who are demanded by the public, and the public in turn is taxing these institutions of learning.

Tax exemption for the non-profit hospital is economically sound. The non-profit hospital bears a public burden. Exemption from the $325,435.60 tax bill of these 64 non-profit hospitals (we do not have exact figures for the remaining eleven) in 1929 would be the equivalent of granting these hospitals an endowment of twenty times that amount, or $6,500,000. Bear in mind, also, that the amount of exemption sought, as taxes of 1929 ($325,435.60) is less than one-sixteenth of one per cent of the total municipal and county tax receipts in California for one year.

Forty-five states in the Union already grant tax relief to their non-profit hospitals, and in recognition of the fact that they bear a large share of the public burden. Is it not fitting that California should join this splendid procession of states? We earnestly ask the support of the readers of this magazine for this measure. Where our cause is understood we receive coöperation, but much needs to be done in the way of informing the voters.

Vote "Yes" on Constitutional Amendment No. 6!

Very truly yours,

HOWARD H. JOHNSON.

PUBLIC POLICY AND LEGISLATION

In the state election of November 6, 1928, a referendum was sustained by the citizens of California which brought into being a readjustment of its two law-making houses, the senate and assembly, which jointly make up the California legislature. Before this issue of CALIFORNIA AND WESTERN MEDICINE reaches its readers the primary election of this state election year 1930 will have been held, and the people of California will know who are to be the candidates for offices in the executive and legislative branches of the state government.

For the convenience of those members of the California Medical Association and its component county medical societies, who through official responsibilities or natural inclinations take an interest in state elections because of their possible effect upon public health matters, the editor is printing in this column a list of the different California assembly and senatorial districts. It is possible that such a list (which is here reprinted from the "Handbook of the California Legislature, Forty-Eighth Session") may act as a handy reference and be of value to members of county society committees on public policy and legislation and to members of the California Medical Association who are coöperating in the work of such committees. For further discussion of these matters, see editorial in this issue of CALIFORNIA AND WESTERN MEDICINE.

I. SENATORIAL DISTRICTS—1930

Districts fixed by Chapter 856, Statutes of 1927, sustained under referendum on November 6, 1928.

These are the counties which make up the various senatorial districts from which state senators will hereafter be elected. The editor has italicized those senatorial districts containing more than one county:

First—Modoc, Lassen, Plumas.
Second—Del Norte, Siskiyou.
Third—Humboldt.
Fourth—Mendocino, Lake.
Fifth—Trinity, Shasta.
Sixth—Butte.
Seventh—Sierra, Nevada, Placer.
Eighth—Tehama, Glenn, Colusa.
Ninth—El Dorado, Amador, Alpine.
Tenth—Yuba, Sutter.
Eleventh—Napa, Yolo.
Twelfth—Sonoma.
Thirteenth—San Francisco.
Sixteenth—Alameda.
Seventeenth—Contra Costa.
Eighteenth—Santa Clara.
Nineteenth—Sacramento.
Twentieth—San Joaquin.
Twenty-first—San Mateo.
Twenty-second—Stanislaus.
Twenty-third—Santa Cruz.
Twenty-fourth—Merced, Madera.
Twenty-fifth—Monterey, San Benito.
Twenty-sixth—Tuolumne, Mariposa, Calaveras.
Twenty-seventh—Kings.
Twenty-eighth—Mono, Inyo.
Twenty-ninth—San Luis Obispo.
Thirtieth—Fresno.
Thirty-first—Santa Barbara.
Thirty-second—Tulare.
Thirty-third—Ventura.
Thirty-fourth—Kern.
Thirty-fifth—Orange.
Thirty-sixth—San Bernardino.
Thirty-seventh—Riverside.
Thirty-eighth—Los Angeles.
Thirty-ninth—Imperial.
Fortieth—San Diego.

II. ASSEMBLY DISTRICTS

These assembly districts are fixed by the Political Code, Section 78, as amended by Chapter 856, Statutes of 1927, sustained under referendum on November 6, 1928.

These are the districts, with names of inclusive counties, from which assemblymen will hereafter be elected. The editor has indicated with numerals (in parenthesis) the number of assemblymen from these different sections of California:

First—Del Norte, Humboldt (1).
Second—Siskiyou, Modoc, Shasta, Trinity (1).
Third—Lassen, Plumas, Sierra, Nevada, Placer (1).
Fourth—Tehama, Glenn, Colusa (1).
Fifth—Butte, Sutter, Yuba (1).
Sixth—Mendocino, Lake (1).
Seventh—Sonoma (1).
Eighth—Napa, Yolo (1).
Ninth—Marin (1).
Tenth—Solano (1).
Eleventh and Twelfth—Sacramento (2).
Thirteenth—Contra Costa (1).
Fourteenth and Fifteenth—San Joaquin (2).
Sixteenth—El Dorado, Amador, Calaveras, Alpine, Tuolumne, Mono, Inyo (1).
Seventeenth—Merced, Mariposa, Madera (1).
Eighteenth—Stanislaus (1).
Nineteenth—San Mateo (1).
Twentieth and Twenty-first—Santa Clara (2).
Twenty-second to Thirty-third—San Francisco (12).
Thirty-fourth to Forty-first—Alameda (8).
Forty-second—Santa Cruz, San Benito (1).
Forty-third—Monterey, San Luis Obispo (1).
Forty-fourth to Forty-sixth—Fresno (3).
Forty-seventh—Tulare, Kings (1).
Forty-eighth—Kern (1).
Forty-ninth—Santa Barbara (1).
Fiftieth—Ventura (1).
Fifty-first to Seventy-second—Los Angeles (22).
Seventy-third and Seventy-fourth—San Bernardino (2).
Seventy-fifth—Orange (1).
Seventy-sixth—Riverside (1).
Seventy-seventh—Imperial (1).
Seventy-eighth to Eightieth—San Diego (2).

MUCH IN LITTLE *

A carefully taken history leads to a correct diagnosis in 85 per cent of our patients.

This is healthy tissue. It is my friend. I will save it.

A gauze drain soon becomes a good cork.

Frequent dressings of superficial wounds keep your waiting room filled—until the insurance company learns your secret.

* Members of the California, Nevada, and Utah Medical Associations are invited to contribute to this column of aphorisms, which will appear from time to time in California and Western Medicine, as sufficient copy accumulates.

TWENTY-FIVE YEARS AGO *

EXCERPTS FROM OUR STATE MEDICAL JOURNAL

Vol. III, No. 9, September 1905

From some editorial notes:

Medical Journals.—On another page we take pleasure in reprinting an editorial note from a recent number of *American Medicine,* in which is put very clearly and forcefully the issue presented to all medical journals by the formation of the Council on Pharmacy and Chemistry of the American Medical Association. . . .

. . . Is it not time, gentlemen of the medical profession, that we should study a little of the Pharmacopeia and teach ourselves a little of what we should know? Or shall we continue forever to "learn" our therapeutics from the smooth-tongued detail man of the nostrum manufacturer? . . .

The X-Ray in Cancer.—Sufficient time has now elapsed for us to take a relatively broad view of the results obtained in the treatment of malignant growths to x-ray exposures. . . . Coley refers to his statements made at the time when this procedure was first suggested, and says, "I then believed, and have since maintained, that the treatment should be strictly limited to inoperable and recurrent cancer, or applied as a postoperative measure that might possibly render recurrences less likely to take place." . . .

The Course of Proprietaries.—Practically all the so-called "patent medicines"—by which is really meant the nostrums advertised and sold directly to the laity—were originally "proprietaries" introduced through the kindly offices of the medical profession and later given directly to the public. Most of those at present in vogue with the medical profession will undoubtedly take the same course in due time. . . .

. . . And yet scores of supposedly decent medical journals are advertising this very same stuff. . . . Is it not astonishing that the medical profession will continue to extend with one hand and accept with the other "gold bricks" like this? To bunco one's own self! It seems almost too ridiculous to be true!

State Journals.—Four more state medical organizations have started medical journals as the medium of publication of their transactions, and one, Maryland, has made an existing journal its official publication. Texas, Ohio, South Carolina, and New Mexico are the states to begin the publication of new journals, and we certainly wish them the very best of success and long and useful lives. . . .

The Lane Lectures.—The institution of annual courses of lectures to be given by men who have shown themselves to be masters in their particular branch of medicine is one to be commended, for a variety of reasons. . . . We hope that in future years, as in the past, the Lane Lectures may continue to be a source of instruction and of inspiration to the physicians of the Pacific Coast.

From an article on "Unity, Peace and Concord." Abstract of a Farewell Address to the Medical Profession of the United States, by William Osler, M. D.

On this occasion I have had no difficulty in selecting a subject on which to address you. Surely the hour is not for the head but for the heart, out of the abundance of which I may be able to express, however feebly, my gratitude for the many kindnesses I have received from the profession of this country during the past twenty-one years, and from you, my dear colleagues of this state and city, during the sixteen years I have dwelt among you. . . .

I have studied to be quiet and to do my own business, and to walk honestly toward them that are without, and one of my chief pleasures has been to work among you as a friend, sharing actively in your manifold labors. . . .

Unity.—Medicine is the only world-wide profession, following everywhere the same methods, actuated by the same ambitions and pursuing the same ends. This homogeneity, its most characteristic feature, is not shared by the law and not by the church, certainly not in the same degree. . . .

Peace.—The physician, like the Christian, has three great foes—ignorance, which is sin; apathy, which is the world; and vice, which is the devil. . . .

Concord.—Unity promotes concord—community of interests, the same aims, the same objects give, if anything can, a feeling of comradeship, and the active coöperation of many men, while it favors friction, lessens the chances of misunderstanding and ill will. One of the most gratifying features of our professional life is the good feeling which prevails between the various sections of the country. . . .

From an article on "Clinical Features of Gall-Bladder and Gall-Duct Affections," by Herbert C. Moffitt, M. D., San Francisco.

The right upper quadrant of the abdomen is a territory so thoroughly explored of late, a field so recently fought over, that it cannot now be made the theater of very stirring events. We are concerned here with diagnosis of different forms of cholecystitis, cholangitis, but particularly cholelithiasis. . . .

From an article on "Report of the Work of the Board of Examiners," by Dudley Tait, San Francisco.

Since the meeting of this society at Paso Robles, a decision has been handed down by the Supreme Court sustaining the medical law regulating the practice of medicine in this state. Written in lucid and logical language by Judge Shaw of Los Angeles, and concurred in by the entire court, this document passes upon the constitutionality of almost every section of the law, thus obviating the necessity for considerable special legislation. . . .

From an article on "A Case of Poisoning From Ceanothus Velutinus, Resembling Rhus Poisoning," by R. F. Rooney, M. D., Auburn.

. . . This is a common shrub throughout the mountains of northern California and southern Oregon, and in places constitutes nearly the sole vegetation, covering acres of mountainside. . . .

. . . The violence of the symptoms and the extensive areas of the body involved, exceeded those of any case of *Rhus* poisoning coming under my notice in many years' experience with the latter affection. . . .

From Medical Society Reports:

From the Minutes of the "Third Annual Meeting of the Pacific Association of Railway Surgeons," Thursday, August 17.—The meeting was called to order at 2 p. m. at Hotel St. Francis, San Francisco, by F. T. Adams, who introduced the president, N. H. Morrison, who then delivered the annual address. . . .

From the Minutes of the "California Public Health Association," Riverside, April 17, 1905.—Meeting was called to order at 11 a. m. by the president, Dr. LeMoyne Wills of Los Angeles, who delivered an appropriate address of welcome, eloquently setting forth the great good to be done by the Association in the cause of sanitation and humanity, and predicting for it a long career of usefulness. . . .

San Francisco County.— . . . The committee on admissions reported the following elected to membership: Dr. Joseph Artigues, Dr. Ernest D. Chipman, Dr. C. E. Leithead. . . .

* This column strives to mirror the work and aims of colleagues who bore the brunt of state society work some twenty-five years ago. It is hoped that such presentation will be of interest to both old and recent members.

CALIFORNIA BOARD OF MEDICAL EXAMINERS

By CHARLES B. PINKHAM, M. D.
Secretary of the Board

News Items, September 1930

A test case of paramount importance to the entire medical profession of California and to all insurance companies operating in the state, was decided yesterday by Division 1 of the District Court of Appeal, when it annulled an award which the Industrial Accident Commission had made to J. Rollin French, M. D., his staff and the Golden State Hospital. The Appellate Court ruled that the Accident Commission had no jurisdiction to award a surgeon, his helpers and the hospital payment directly from an insurance company, but that such debts must be paid from awards which the commission makes to an injured man. . . . Doctors and insurance carriers throughout the state awaited the outcome of the present case. . . . The exact point involved . . . was whether doctors and hospitals can collect from an insurance company after the company has given notice that it no longer desires them to service the employees of an employer for whom it is the carrier. In this instance the Pacific Employers' Insurance Company gave written notice of the termination of the medical care agreement, but the hospital and surgeon continued to treat cases, on the assumption pay could be collected from the insurer. . . . The appellate decision has nullified such procedure (Los Angeles *News*, July 1, 1930).

One hundred and sixty-three applicants for written examination reported at the regular meeting of the board held in San Francisco, July 7 to 10, and seventy-three applicants for written examination reported at the special examination held in Los Angeles the week following.

On the legal calendar at the San Francisco meeting appeared the names of twenty-four licentiates called before the board for various derelictions. After hearings by the board the following action was taken:

Rose Boido, M. D., charged with alleged illegal operation, failed to appear. Default was entered and on July 8, 1930, Doctor Boido's license to practice as a physician and surgeon in the State of California was revoked.

Francis J. Bold, M. D., Whittier, charged with an illegal operation on Mrs. Carmelita Wilhite, deceased, and in a second complaint charged with a similar operation on Mrs. de la Cuesta, was found guilty by the board and on July 10, 1930, his license to practice in California was revoked. A writ of certiorari has been filed for review of the testimony by the Superior Court in Los Angeles.

Oscar de Vaughn, M. D., of Oakland, charged with an alleged illegal operation, was found guilty and on July 8, 1930, his license to practice in California was revoked. A writ of certiorari to review the findings of the board before the Superior Court has been filed.

Elmer F. Kinne, M. D., charged with a narcotic violation, was on July 9, 1930, found guilty and placed on five years' probation without possession of narcotics or a permit to prescribe narcotics.

William McNaul, M. D., charged with a narcotic violation, was on July 9, 1930, found guilty and placed on probation for five years without narcotic permit or possession.

Elena Rinetti, Los Angeles midwife, charged with an illegal operation, made no appearance. Default was entered and after the board's case was submitted, on July 9, 1930, her midwife license was revoked.

The report of the legal department on appeals pending in the courts of this state following revocation showed the status as follows:

Pearl Anderson vs. Board (revoked July 11, 1928). On July 6, 1930, board sustained by Superior Judge Goodell of San Francisco.

Frank M. Moran vs. Board (revoked March 1, 1928). Revocation sustained. No appeal.

Eugene Rinaldo vs. Board (revoked July 9, 1924). Restored by court July 3, 1928. Board's appeal pending in Appellate Court.

Petitions of Thomas Greig, Ernest R. Hoffman, Lewis T. A. Hotten, and Franklin Kerr for restoration of revoked certificates were denied.

According to a circular from the sheriff's office dated San Diego, August 7, 1930, A. B. Gersabeck, alias Dr. Alfred Bach, is wanted for escape from the county hospital, to which he had been transferred from jail where he was under sentence of a fine of $600 and 180 days following his conviction on June 5, 1930, of violation of the Medical Practice Act. This individual's specialty seems to be obtaining money from nurses under promise of lucrative employment in a prospective sanitarium. (Previous entries August and September 1926; July 1927; September 1928.)

Reports of swindles by eyesight fakers continue and at present there are felony and misdemeanor warrants outstanding in Fresno, Los Angeles, Orange, Riverside, and San Diego counties. The board is in possession of affidavits identifying the individuals as shown in the pamphlet on eyesight swindlers edited by the secretary of the Board of Medical Examiners.

Complaint was recently filed in the Municipal Court of Los Angeles, charging Frank Faircloth and John F. Gebhardt, alleged eyesight swindlers, with violation of the Medical Practice Act and bail fixed in each case at $500.

Division 1 of the District Court of Appeal today granted a new trial to Dr. George E. Darrow, convicted in the Superior Court on a second degree murder charge of having performed an illegal operation with fatal results to the patient. Court error in ruling on objections by the defense to the admission of certain testimony was responsible for the reversal. The woman died in Doctor Darrow's office, but the physician testified that he merely was examining the patient at the time (Los Angeles *Record*, July 31, 1930). (Previous entries, September, October, November, December, 1929; January and March, 1930.)

Charles Lew, Chinese herbalist, on July 29, 1930, pleaded guilty in the Justice Court at Redlands on a charge of violation of the Medical Practice Act and paid a fine of $100.

On July 30 Mr. and Mrs. Ben Stone of High Grove, Riverside County, who had been swindled out of $812.50 by eyesight swindlers, filed a complaint charging Roy L. Martin and Elliott Wilkinson, asserted eyesight swindlers, with violation of the Medical Practice Act.

According to report by Special Agent Carter, D. J. Bussell was found guilty of violation of the Medical Practice Act and on July 31 was sentenced to pay a fine of $100 or serve twenty days in the city jail, following which he was placed on probation on condition that he should not have any medical instruments or Chiropractic instruments in his possession. Mr. Carter expressed interest in knowing what "Chiropractic instruments" are.

According to reports of our investigation department, Mary Poe, Paso Robles "Chirothesian," on July 11 pleaded guilty to a violation of the Medical Practice Act and was sentenced to serve ninety days in the county jail, suspended on condition that she surrender her Chirothesian certificate. It is reported that following her arrest some four years ago by representatives of the Chiropractic Board, she purchased for $300 a Chirothesian diploma under the impression that it gave her authority to treat the sick and afflicted in this state.